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## INDEX OF SUBJECT MATTER

- ABDOMEN**, Prevention of postoperative adhesions in, 2; relation of development of gastro-intestinal tract to surgery of, 23; radiographic study of organs of, after inflation of peritoneal cavity, 42, 121, 139, 282, 283, 370, 371; spondylitis and pain in, 38; healing effect of air in, 458
- Abducens palsy**, Transplantation of vertical recti in, 71
- Abortion**, Therapeutic, 57; Wassermann reaction and, 142; etiological factors in, 225; and infant mortality, 230; treatment of inevitable, 403; non-interference in infections following, 405
- Accident**, Disease resulting from, 43; death due to disease but accelerated by, does not warrant recovery on insurance policy, 310; surgery and secondary wound healing, 462
- Acidosis**, Mechanism and clinical manifestations of, 208; occurrence after anaesthesia, 258
- Adenoids**, Anaesthesia for removal of, 331
- Adhesions**, Causes of postoperative intra-abdominal, and means of preventing, 2
- Adrenalin**, Injections of, into heart, for resuscitation, 434
- After-treatment of some surgical cases**, 346
- Air**, Healing effect of, in abdominal cavity, 458 *See also* Pneumoperitoneum
- Albee**, Treatment of pseudarthrosis of neck of femur by method of, 201
- Alveolar infections of dental origin as seen by roentgenologist**, 332
- Amputation**, Establishment of collateral vascular system in limbs following, 25; trophic changes in stumps of lower limbs following, 26; workmen's compensation before and after, 215; of leg, 377; neuromata following, 383
- Anæmia**, Results of splenectomy in pernicious, with special reference to tuberculosis, 193; blood transfusion before operation in severe secondary, 345 7/8
- Anæsthesia**, And cerebral and spinal surgery, 2; induced by intratracheal insufflation of chloroform, 3; in lung surgery, 3; hæmorrhoid operation under local, 18; in vaginal operations, 49; in obstetrics, 58; lung abscess following tonsillectomy under local, 171; extirpation of subjects, 76; present status of general, from hospital point of view, 102; third-stage ether, 103; effects of atropine on hyperglycæmia due to chloroform, 103; results of ether, on pulmonary tuberculosis, 103; anhydrous cocaine spinal, 104; spinal, in gynecology, 104; in throat and nose operations, 170, 416; effect of ether, on circulating leucocytes, 171; changes in rectal mucosa following, induced with ether given by rectum, 171; disadvantages of novocaine, 171; extirpation of mammary cancer under local, 181; occurrence of acidosis after, 258; saligenin and other phenyl carbinols for local, 259; spinal, induced with cocaine in operative gynecology and obstetrics, 259; induced with nitrous oxide for dental surgery, 260; cesarean section under local, 318; for adenoid and tonsil work, 331; mixture of ethyl chloride, chloroform, and ether for general, 349; advantages of local, in thyroid operations, 349; modification of open ether method of inducing, 349; in experimental surgery, 388; tonsillectomy under local, 418, 491; in operations on thyroid, 436; general, 437; stovaine spinal, 438; twilight sleep, 478
- Anæsthetics**, Surgical, in diabetes mellitus, 2; in obstetrics, 142, effect of, on inflammation, 348; effects of, on shock, 348; anuria in normal animals during use of general, 388; advantages and disadvantages of various local, in nose and throat work, 416
- Anaphylaxis**, Relation of antitryptic titre of blood to bacterial infection and, 132; nature of serum antitrypsin and its relation to autolysis and formation of toxins in, 132
- Aneurism**, Arteriovenous, of internal carotid, 262; elevation of temperature of hand and forearm following excision of subclavian, 435; surgical treatment of popliteal, 468
- Angiomata**, Treatment of, with radium, 393
- Anthrax**, Surgical and non-surgical methods of treating, 210; infection with; claimed in lawsuit to be accident, 215
- Antigen therapy**, Partial, in surgical tuberculosis, 210
- Antitryptic titre of blood**, Relation of, to bacterial infection and anaphylaxis, 132
- Antrum**, *See* Sinus
- Anuria**, Nephrotomy in eclamptic, 317; in normal animals during use of general anaesthetics, 388
- Anus**, Tuberculous fistula of, 18; treatment of pruritis of, with X-ray, 134; diseases of, in young soldier, 453
- Aorta**, Isolated compression of, in obstetrical hæmorrhage, 60
- Appendectomy**, Technique of, 16; ileostomy for postoperative obstruction following, 116; by new route and simplified procedure, 189; for acute appendicitis developing in latter weeks of pregnancy, 478
- Appendicitis**, Clinical application of Carrel-Dakin method to acute, requiring drainage, 16; acute, at beginning of crisis, 115; syndrome of, and pseudo-appendicitis associated with dysentery, 115; present status of early operation for, 116; results of operations for chronic, 189; in pregnancy, 224, 478; acute, 278; relation of, to intrapelvic disease in women, 400; in young soldier, 453
- Appendicostomy for intestinal stasis in epilepsy and neurasthenia**, 454
- Appendix**, Dyspeptic and other referred symptoms associated with disease of, 118; X-ray phenomena in region of, 133; pointed foreign bodies in intestine extracted through, 188
- Arteries**, Relation of, supplying stomach and duodenum to ulcer, 111; hypertension in, associated with endocrine dyscrasias, 293; elevation of temperature of hand and forearm following excision of subclavian aneurism and ligation of subclavian and axillary, 435; first treatment of gunshot wounds of common and internal carotid, 444
- Artery**, Circular suture of brachial, 211; arteriovenous aneurism of internal carotid, 262; progressing thrombosis and embolism in region of internal carotid, following contusion and ligation, 263; accidents and precautions in ligation of common carotid, 263; of uterine round ligament, 399; surgical treatment of aneurism of popliteal, 468
- Arthritis**, Effect on, of removal of distant focus of infection, 195; second great type of chronic, 374
- Atrophy**, Treatment of, of muscles by artificial stimulation, 379
- Atropine**, Effect of, on chloroform hyperglycæmia, 103

- Autolysis, Relation of serum antitrypsin to, and formation of toxins in infection and anaphylaxis, 132
- Axilla, Treatment of wounds of important vascular trunks of, 386
- B**ACK, Treatment of injuries of, with reference to spinal fracture not associated with cord symptoms, 30; mechanical arrangement and treatment of weaknesses of muscles and ligaments in lumbar region of, 464
- Bacteria, Factors leading to removal of, from peripheral circulation, 302; relation of life cycles of, to pathology, 387; importance of determining nature of, in accessory nasal sinuses and ears, 491
- Barany rotation test in tumors of nervus acusticus, 489
- Beef-bone screws, Use of, in treatment of fractures and bone transplantation, 29
- Bile, Relation of, to lesions of liver, 455
- Bile duct, Cysts of common, 191; digestion and absorption of fats in congenital, atresia, 457
- Bile tract, Clinical importance of anatomical anomalies in surgery of, 280
- Birth palsy, Brachial, and similar injuries in adults, 194
- Bladder, Complete closure of urinary, after coagulation of tumors, 68; indigo-carmin test of, 69; hour-glass, 147; histologic study of mucosa in ectrophy of, 146; management of tumors of, 148, 409; disturbances of, in myelodysplasia, 148; problems concerning calculi of, 152; operative treatment of fistula involving, and vagina, 221; gunshot wounds of, 234; endoscopic treatment of tumors of, with high-frequency current, 326; contracture of neck of, 326; skill and care required to incise, 395; epithelium of, in man, 409; value of radium in treatment of tumors of, 410; application of radium to neoplasms of, in the male, 411; malignant tumors of, in employees of organic chemical industry, 485
- Blood, New method of testing phagocytosis with plasma of, 35; coagulation of embryonic, 36; calcium content of, especially in cancer, 120; relation of antitryptic titre of, to bacterial infection and anaphylaxis, 132; new method for determining coagulation time of, in newborn, 143; clot dressing in mastoidectomy, 154; chemical changes in, in disease, 211; after splenectomy, with special reference to circulating leucocytes, 370; in hyperthyroidism and struma, 384; anticoagulant action of sodium citrate on, and part played by calcium in, 467
- Blood pressure, In surgery, 37; vascular reactions in high, 37; high, at menopause, 222; functional, 385
- Blood transfusion, 385; apparatus for, 4; treatment of eclampsia by, 227; dangers associated with, 298; value of, before operation in severe secondary anæmias, 345; rubber tubing as factor in reaction to, 467
- Blood vessels, Reactions in, in hypertension of, 37; effect of arteriovenous fistula on heart and, 38; roentgen-ray study of great, 41; treatment of wounds of important, in neck, axilla, and supracardiac mediastinum, 386; influence of injuries to, on peripheral circulation, 386. *See also* Aneurism, Arteries.
- Blow, Effect of, while working under extreme heat, 310
- Bone, Case of hydatid infestation of, with multilocular hydatid disease, 24; obturation of cavities in, with muscle strips, 200; osteitis fibrosa and cyst of, with congenital fracture of tibia, 459
- Bone clamps, Clinical study of open reduction of fractures of long bones with new, 169
- Bone grafting, In treatment of fractures, 27, 197; use of beef-bone screws in, 29; repair of defects in skull by, 260, 351; in reparative surgery, 289; of fractured mandible, 354; contribution to, 462, 464
- Bones, Spontaneous fractures in starvation diseases of, 26; new method for immediate sterilization and closure of chronic infected wounds of, 29, 169; diseases of, due to starvation, 31, 194; open reduction of fractures of long, with new bone clamps, 169. *See also* names of bones and bone diseases.
- Brace, Ready-to-wear, for strained muscles and ligaments, 350
- Brachial birth palsy and injuries of similar type in adults, 194
- Brain, Surgical treatment of pressure on, 172; finger exploration of gunshot wounds of, 173; extraction of foreign bodies in pteromaxillary fossa and base of, 173; eight years' experience with tumors of, 352; diagnosis of abscess of, 353; endothelioma of, 441; indications for removal of foreign bodies in, 441; lesions of, involving auditory and vestibular apparatus, 490. *See also* Cerebrum, Head, Medulla oblongata, Skull.
- Breast, End-results of treatment of cancer of, before and after introduction of prophylactic X-ray treatment following operation, 10; benign tumors of, 179; precancerous lesions of, 180; extirpation of cancer of, under local anæsthesia, 181; influence of X-ray after operation for carcinoma of, 360; late results after radical operation for cancer of, 447; technique in operations for cancer of, 447; traumatic fat necrosis in female, 447
- Breathing, Low-pressure, in practical surgery, 350
- Bronchi, Physical signs of foreign bodies in, 10; foreign bodies of dental origin in, 182; diagnosis and localization of non-opaque bodies in, 360; new instrument facilitating bronchoscopy for foreign bodies in, 439
- Bronchopneumonia, Classical cæsarean section in certain forms of, in pregnancy, 402
- Bronchoscopy, New instrument facilitating, for foreign bodies, 439
- Bucknall, Operation of, for hypospadias, 149
- Bunions, Surgical treatment of, 378; etiology of, 460
- C**ARTILAGE, Nutrition of articular, 212; grafting of, in reparative surgery, 289
- Cartilaginous exostosis, Multiple, 25, 122; calcium and magnesium metabolism in, 387
- Cataract, Application of radium in cases of, 71; capsule in extraction of, 238; operations for removal of, in cases of glaucoma, 489
- Cerebrospinal fever, Epidemic, and sphenoidal empyema, 155
- Cerebrum, Anæsthesia and surgery of, 2; earliest degenerative changes in traumatic lesions of, 6; tumors of, 172; palliative trephining in processes of, 261. *See also* Brain
- Cervical rib, 106, 176
- Check, Receiving, "in full of account," 394
- Chest, Surgery of, in relation to retained projectiles, 182; penetrating gunshot wounds of, 266
- Chiropactor as assistant to regular physician, 136
- Chlorine antiseptics, 258
- Chlorlyptus, Chemical and clinical study of, 2
- Chloroform, Intratracheal insufflation of, 3; effect of atropine on hyperglycæmia due to, 103; sodium carbonate in poisoning due to, 305; mixture of ethyl chloride, ether, and, for general anæsthesia in war surgery, 349
- Cholecystitis, Diagnosis and treatment of, 20
- Cholelithiasis, Diagnosis and treatment of, 20; pathology and treatment of, 119; prophylaxis and treatment of, 192
- Cholesteatoma, Etiology and biology of, 33; etiology, treatment, and results of, 35



- Chondrodysplasia, 25
- Circulation, Establishment of collateral, in limbs, 25; factors leading to removal of bacteria from peripheral, 302; influence of injuries to blood vessels on peripheral, 386; disturbances of, in pregnancy, 401
- Circumcision, 150
- Civil practice, Application of military surgery to, 134
- Civil suits, Verdict of coroner's jury held not admissible in evidence to fix liability in, 216
- Clavicle, Results of total excision in sarcoma of, 458
- Cæcostomy for intestinal stasis in epilepsy and neurasthenia, 454
- Cæcum, Actinomycosis of, 277
- Cæsarean section, 55; primary abdominal pregnancy subsequent to, 226; rupture of scar of, in pregnancy or labor, 227; under local anaesthesia and morphine and scopolamine narcosis, 318; conservative, after rupture of membranes, 318; classical, in bronchopneumonia in pregnancy, 402; in acute appendicitis developing during latter weeks of pregnancy, 478
- Calcium, Content of blood in cancer, 129; metabolism in multiple cartilaginous exostosis, 387; part played by, on coagulation of blood, 467
- Camphor-oil tumors, 33
- Cancer, Relation of structure of, tissue to radiation, 34; X-ray treatment of, 40; pathogenesis of, 126; calcium content of blood in, 129; causes and definition of, 294; fever in diagnosis of, 295; cure of, 295; amelioration of, and immunity to, 296; lethal dose of radium in, 307, 470; erythema dose of radium in, 470. *See also* Carcinoma, Malignancy, and names of organs.
- Carbohydrates, Rôle of, in treatment of toxæmias of early pregnancy, 52
- Carbon dioxide, Therapeutic use of, after anaesthesia and operation, 1
- Carcinoma, Squamous-cell, of cornifying type, 128; use of mesothorium and radium in treatment of, of genital organs, 476. *See also* Cancer, Malignancy, and names of organs.
- Carotid artery. *See* Artery
- Carotid gland, Adenomata of, 263
- Carrel-Dakin method, Clinical application of, to acute appendicitis requiring drainage
- Club-foot, Treatment of congenital, 289, 463
- Coagulation, In embryonic blood, 36; new method for determining time of, of blood in new-born, 143; action of sodium citrate and calcium on, 467
- Cocaine, Spinal anaesthesia induced with, 140, 259
- Coccyx, Fistulae and cysts involving, and sacrum, 31
- Cold and fever constitute disease, 308
- Colectomy, Treatment of chronic intestinal stasis by total, 117
- Colitis, Operative treatment of ulcerative, 116
- Colon, Surgery of descending, 117; fistula involving, and jejunum following gastrojejunostomy, 277; resection of, by three-stage method, 453. *See also* Intestines and names of conditions of colon.
- Colostomy, Permanent, which may be closed by extra-peritoneal operation, 15
- Condyloma acuminatum, Etiology and biology of, 33
- Cornea, Nature of so-called blood infiltration of, 488
- Coroner's jury, Verdict of, held not admissible in evidence to fix liability in civil suits, 216
- Corpses, Responsibility for inquiry regarding relatives before dissection of, 310
- Cranium, *See* Skull
- Crippled children, Care of, 196
- Curettage, Uterine, 472
- Cyst, Congenital retroperitoneal, arising from wolffian body, 24; mesenteric or enterogenous, 24
- Cysts, Sacrococcygeal, 31; importance of certain data in diagnosis of ovarian, 47; gas, of intestines, 116; congenital, of neck, 144; relationship between ranula and branchiogenetic, 443; relationship of hydatid, in children to those occurring in adults, 456
- Cystitis, Cystic, 146; circumscribed panmural ulcerative, 147
- D**EAFNESS, Relation of hypertension and hypotension of membrana tympani to, 414
- Deycke-Much, Partial antigen therapy according to, in surgical tuberculosis, 210
- Diabetes, Surgical anaesthesia in, mellitus, 2; experimental chronic pancreatic, 21; pancreatic lithiasis and, mellitus, 282
- Diaphragm, Pleural effusion with inversion of, 10; hernia of, 23; 257; roentgen-ray studies of functional alterations of, 41; disturbance of excursions of, in peritoneal tuberculosis and paranephritis as determined by X-ray, 110
- Diastase in urine in toxæmias of pregnancy, 477
- Diet in pregnancy, 401
- Diphtheria endemic in new-born in obstetrical clinics, 321
- Disease, Resulting from accident, 43; chemical changes in blood in, 211; question whether or not chronic held on evidence for jury, 215; liability of false representations as to, 217; cold and fever constitute, 308; death by, accelerated by accident does not warrant recovery on accident policy, 310; studies on calcium and magnesium metabolism in, 387; relation of life cycles of bacteria to, 387
- Dissection, Responsibility for inquiry before corpses may be used for, 310
- Diverticulitis, 189, 369
- Drainage, Technique of, in suppurations, 434
- Ductless glands, *See* Endocrine glands
- Duodenum, Gastro-enterostomy treatment of choice for chronic ulcer of, 15; new views on pathology, diagnosis, and treatment of ulcer of, 111; relation of arteries of, to ulcer, 111; perforated ulcer of, 112; results of surgical treatment of ulcers of, 112; 275, 365; postoperative morbidity of ulcer of, 113; carcinoma of, 114; cancer of angle of, with jejunum, 115; treatment of fistula of, 118; use of soft duodenal sound for examining secretion of, for occult bleeding in ulcer of, 275; symptoms of ulcer of, 450.
- Dysentery, Surgical aspects of, 16, 465; syndrome of appendicitis and pseudo-appendicitis associated with, 115
- Dysmenorrhœa, Treatment of obstructive, 45
- Dyspepsia associated with disease of gall-bladder and appendix, 118
- E**AR, Problems relating to chronic suppurative discharge of middle, 72; suppurative disease of middle, 153; diagnosis and treatment of syphilis of, 156; labyrinthine complication of suppuration of middle, 239; anatomical features of vestibule, 239; intracranial lesions involving auditory-vestibular apparatus of, 490; clinical significance of bacteriological examination of nasal accessory sinuses and, 491
- Echinococcosis, Alveolar, in man and bovine multilocular, 383
- Eclampsia, Treatment of, by transfusion of blood, 227; nephrotomy in anuria of, 317
- Electrical stimulation of nerves at operation, 208
- Embolism following gynecological operations, 100
- Embryo, Coagulation in blood of, 36
- Embryology and surgery, 383
- Employees, Hospital liable for negligence of, 394

- Empyema**, Treatment of, by closed method, 9; management of, 107; immediate closure in cases of, 178; observations on, 358; operative treatment of, 359; operation for, in young adults, 360; physical factors in treatment of, 360
- Encephalitis lethargica** in pregnancy, 53
- Endocrine glands**, Arterial hypertension associated with dyscrasias of, 293; congenital absence of vagina and uterus in the light of more recent studies of, 399; correlation of function with special reference to, 314; treatment with, 466
- Endometrium**, Relation of hyperplasia of, to so-called functional uterine bleeding, 396
- Endothelioblastomata**, Hæmangioma group of, 32
- Enterocolitis**, Roentgenology of tuberculous, 185
- Enterostomy**, Permanent, which may be closed by extraperitoneal operation, 15; secondary, following operations for peritonitis and ileus, 100
- Epilepsy**, Recoveries from, following surgical correction of abdominal viscera, 371; appendicostomy and cæcostomy for intestinal stasis in, 454
- Epinephrin**, Hypersensitiveness to, in diagnosis of hyperthyroidism, 208
- Epithelioma**, Histologic resemblance of, to Oriental sore, 126. *See also* under names of organs
- Equinovarus**, Congenital, report of cases, 285
- Erysipelas**, Liability for, 44; effect of anæsthetics on, 348
- Ether**, Third stage, anæsthesia, 103; results of anæsthesia induced with, on pulmonary tuberculosis, 103; changes in rectal mucosa following narcosis induced with, given by rectum, 171; effect of anæsthesia induced with, and subcutaneous injections of, on circulating leucocytes, 171; modification of open, method, 349; mixture of ethyl chloride, chloroform, and, for general anæsthesia in war surgery, 349
- Ethmoid**, Operation on, 74; operations on, for pan-sinusitis, 330
- Ethyl chloride**, Mixture of, with chloroform and ether for general anæsthesia in war surgery, 349
- Eustachian tube**, Physiological study of, and its related muscles, 328
- Examination**, May testify in lawsuit to making, but not as to results, 395
- Expert evidence** in lawsuits, 42
- Eye**, Removal of magnetic foreign bodies from vitreous, 71; third-stage ether anæsthesia; a subclassification based on position and movement of, 103; examination required in lawsuit to determine injury to, 136; enucleation of, and its substitute operations, 153; removal of steel from, from industrial standpoint, 238; effect of certain intranasal conditions on extrinsic muscles of, 238; reactions of, to syphilis, 414; plastic operations about lids and socket of, 488; early diagnosis of pituitary tumor with symptoms in, 488; removal of non-magnetic foreign bodies from anterior chamber of, 489. *See also* names of parts of eye and eye operations
- FACE**, Principles of orthodontia in treatment of injuries of, and maxilla, 175; infection carried from toe to, 216; use of radium in carcinoma of, 353; surgery of injuries of, during war as applied to civil practice, 354; tumors of, 442
- Fallopian tubes**, Inflammation of, in prolapse of uterus, 46; determination of patency of, in sterility by intra-uterine inflation with oxygen, 139; essential varicocele of, 398; cystadenoma of, 398
- Fat**, Traumatic necrosis of, in female breast, 447; digestion and absorption of, in congenital atresia of bile ducts, 457
- Femur**, Treatment of fresh and ununited fractures of neck of, 28; treatment of pseudarthrosis of neck of, by Albee's method, 201; treatment of compound fractures of, 287; ununited fractures of neck of, 461. *See also* Hip
- Fever**, Association of, with fracture of skull, 5; factor of, in diagnosis of cancer, 295; cold and, constitute disease, 308
- Fibro-adipose grafts** in reparatory surgery, 289
- Fibula**, Fractures of, treated by plating operations, 28
- Fischer's apparatus**, Use of, for fractures of patella, os calcis, and olecranon, 199
- Fistula**, Tuberculous, of anus, 18; sacrococcygeal, 31; effect of arteriovenous, on heart and blood vessels, 38; treatment of duodenal, 188; operative treatment of vesicovaginal, 221; jejunocolic, following gastrojejunostomy, 277; of Stenon's duct, 443
- Fœtus**, Mycosis of membranes of, due to mould of genus mucus, 39; syphilis as case of death of, 481
- Foot**, Measurement and correction of weakened, 123; treatment of weak or flat by new combination support, 124; bony changes in, following fracture of vertebrae, 124; congenital deformities of, 196; temporary disarticulation of, for tuberculosis, 291; prevention and treatment of weak, in children, 375
- Foreign bodies**, Removal of metallic, by surgical operations under direct X-ray control, 345. *See also* names of organs
- Formication test** in peripheral nerve injuries, 382
- Fractures**, Spontaneous, in starvation osteopathies of youth, 26; open treatment of, 26; use of autogenous bone grafts in treatment of certain simple, 27; use of beef-bone screws in, 29; plating of simple, 124; points to be observed in first ten days of treatment of compound, 125; conservative treatment of severe gunshot, 197; bone-grafting in treatment of, 197; treatment of, with Schoenmann clamp, 197; treatment of birth, 229; personal experience with treatment of, 285; union of septic compound, 286; treatment of septic, 460. *See also* under names of bones
- Fredet-Rammstedt operation** for congenital hypertrophic stenosis of pylorus, 366
- Friedmann's treatment** in surgical tuberculosis, Results of, 383
- Function**, Correlation of, with special reference to organs of internal secretion and reproductive system, 314
- GALL-BLADDER**, Analysis of diseases of, 19; occurrence of hypochlorhydria in disease of, 118; dyspeptic and other referred symptoms associated with disease of, 118; diagnosis of chronic pathologies of, 191; obstruction of, 192; early lesions of, 192; importance of anatomical anomalies of, in surgery, 280; surgery of, 282; diagnosis and treatment of affections of, 370; treatment of diseased, 457; torsion of neck of, 457. *See also* Bile tract, Cholecystitis, Cholelithiasis
- Gall-duets**, Analysis of diseases of, 19
- Gall-stones**, X-ray diagnosis of, 456. *See also* Cholelithiasis
- Gas cysts of intestine**, 116
- Gas gangrene**, Action of certain organs and systems in, 38
- Gasserian ganglion**, Trigeminal neuralgia treated by injection of alcohol into, 106; operation on, for relief of trigeminal neuralgia, 442
- Gastrectomy**, New technique for, 367
- Gastro-intestinal tract**, Relation of development of, to abdominal surgery, 23; roentgen-ray demonstration of abnormalities of, in children, 110; common forms of tuberculosis of, 185; pathologic findings in roentgen-ray examinations of, 212



Gastrojejunostomy, Jejunocolic fistula following, 277; ulcer of jejunum following, 368

Genital organs, Schauta-Wertheim operation for prolapse of, 50; trachelopexy for severe prolapse of, 218; correlation of function with special reference to, 314; X-ray treatment of tuberculosis of, in female, 474; tuberculosis of, in female from modern viewpoint regarding tuberculosis and question of ovarian tuberculosis and primary abdominal pregnancy, 474; results obtained with mesothorium and radium in carcinoma of, 476

Genito-urinary organs, Cystoscopic diagnosis and treatment of certain lesions of, 151; action of prostatic extracts on excised, 486; diagnosis and treatment of tuberculosis of, 486

Gibbon's hydrocele, 363

Glaucoma, Technique of puncture for, 71; operative treatment of, 238; operations for cataract on patients with, 489

Goiter, Toxic, following epidemic influenza, 107; basal metabolic rate in, 125; principles underlying treatment of toxic, 176; X-ray treatment of exophthalmic, 266; toxic non-exophthalmic, 355; prevention of simple, 355; diagnosis and management of intrathoracic, 356; mistakes in thyroidectomies for, and new method of cauterizing in exophthalmic, 356; blood findings in, 384; management of toxic from surgical point of view, 445; results of operations for adenoma with hyperthyroidism and exophthalmic, 446; radium in toxic, 446; toxic adenoma in relation to exophthalmic, 446

Gonococcus, New culture method for, 468; infection due to, in childhood, 48

Gonorrhoea, In childhood, 48; treatment of, in female, 50, 139; vaginitis due to, in children, 313

Granuloma, Venereal, 150

Growth deformities, Cause of, 203

Gynecology, Teaching of, 62, 63; spinal cocainization in operative, 259; spinal anaesthesia in, 104

**H**EMANGIOMA group of endotheliomata, 32

Haematuria, Observations on, of chronic infectious focal nephritis, 68; significance of, 413; essential renal, treated by injections of silver nitrate, 484

Haemic basophile, 128

Haemopericardium secondary to wounds of heart, 361

Haemorrhage, Isolated compression of aorta to stop, in obstetrical practice, 60; from ovaries, 219; value of minimum pressure in prognosis of severe puerperal, 319

Haemorrhoids, Successful operation for, under local anaesthesia, 18; cure of, without operation, 190; haemorrhage following operative treatment of internal, 347

Haemostasis, In placenta praevia centralis, 57; effected by isolated compression of aorta, 60; agents for effecting, 298

Hallux valgus, End-results of operations for, 378

Hand, Infections of, 195

Harelip, Treatment of congenital lateral, 262

Head, Fluoroscopic examination of injuries of, 4; artificial rotation of, in occipitoposterior position, 59; wounds of cared for at evacuation hospital, 173; late treatment of gunshot wounds of, 261. *See also* Brain, Skull, etc.

Healing, Mechanism of wound, 299; accident surgery and secondary, 462

Heart, Effect of arteriovenous fistula on, 38; wounds of, with delayed symptoms, 361; surgery of, 361; injection of adrenalin into, for resuscitation, 434

Heat, Effect of blow while working under extreme, 310

Hemiplegia, Infantile, 379

Hepatopexy, Contribution to, 118

Hernia, Radical cure of femoral, by inguinal route, 12, 13; cause and treatment of abdominal, 12; operation for femoral, 14; diaphragmatic, 23, 257; modified technique for radical cure of inguinal, in male, 270; utilization of external oblique aponeurosis in treatment of inguinal, 271; subcutaneous rupture of intestine caused by direct trauma in case of irreducible inguinal, 276; management of direct inguinal, 363; enormous, 363; infantile, 363; modified technique for treatment of inguinal, 449; in young soldier, 453

Herniotomy, Inguinal route in femoral, 12, 13

Hip, Operative treatment of irreducible paralytic dislocation of, 197; open operation for congenital dislocation of, 376. *See also* Femur

Histamine, Presence of, in extracts of posterior lobe of pituitary gland, 304

Hospital, Present status of general anaesthesia from viewpoint of, 102; liability of, for treating white patient like colored patient, 136; implication from collection of fee of, 214; construction of statute making records of, admissible in evidence in lawsuit, 394; liability of, for negligence of employees, 394

Hydatid cysts, Relation of, in children to those in adults, 456

Hydatid infestation of bone with multilocular hydatid disease, 24

Hydramnion, Puncture of uterus in, 59

Hydrocele, Gibbon's, 363

Hyperglycemia, Effect of atropine on chloroform, 103

Hypernephroma, Results of operative treatment of, 408

Hypertension, Vascular reactions in vascular, 37; at menopause, 222; relation of, of membrana tympani to deafness and tinnitus, 414

Hyperthyroidism, Epinephrin hypersensitiveness test in diagnosis of, 208; blood findings in, 384; adenoma with, 445; results of operations for adenoma with, and exophthalmic goiter, 446

Hypochlorhydria, Occurrence of, in gall-bladder disease, 118

Hypochondriasis, Value of surgical intervention in, 384

Hypophysis, Interrelation of thyroid and, in growth and development of frog's, 131

Hypospadias, treated by operation of Bucknall, 149

Hypotension, Relation of, of membrana tympani to deafness and tinnitus, 414

Hypothetical questions, 42

Hysterectomy, Abdominal, 313; carcinoma of cervical stump after supravaginal, 396; menstruation after complete, due to uterine mucosa in remaining ovary, 472; total, for fibroid tumors of uterus, 473

**I**LEOSTOMY for postoperative obstruction following appendectomy, 116

Ileum, Simple ulcer of, 15

Ileus, New aid in early recognition of postoperative, 100; secondary enterostomy following operations for, 100

Imbecility, Admissibility in lawsuit of evidence touching, 308

Immunity, Fluctuations in concomitant, 131; to cancer, 296

Indigo-carmin as bladder test, 69

Infantile paralysis, Orthopedic treatment of, 30

Infection, Relation of antitryptic titre of blood to bacterial, 132; relation of serum antitrypsin to autolysis and formation of toxins in, 132; results of removal of distant focus of, in arthritis, 195; carried from toe to face, 216

Inflammation, Operative treatment of pelvic, 222; effect of anaesthetics on, 348

Influenza, Acute osteomyelitis and periosteitis complicating epidemic, 25; and pregnancy, 53; toxic goiter following epidemic, 107; mastoiditis due to, 414



- Injury, Privilege as to physician employed prior to, 443; evidence of connection between negligence and, 394
- Insanity, Rules relative to, as defense to crime, 217; competent medical witness and evidence of, 394
- Internal secretion, *See* Endocrine glands
- Intestine, Carcinoma of splenic flexure of large, 117; diverticulitis of large, 189, 369; rupture of, due to trauma in case of irreducible inguinal hernia, 276; lateral anastomosis of, through vagina, 276; surgery of cancer of large, 368; subserous adenomyomatosis of small, 368
- Intestines, Ileostomy for postoperative obstruction of following appendectomy, 116; gas cysts of, 116; total colectomy for chronic stasis of, 117; roentgenology of tuberculosis of, 185; pneumatosis cystoides of, 451; obstruction of, by pelvic exudates following gynecological operations, 452; appendicostomy and cæcostomy for stasis of, in epilepsy and neurasthenia, 454; acute obstruction of, 452; radiology in chronic stasis of, 133; common forms of tuberculosis of stomach and, 185; extraction of pointed foreign bodies from, by appendicular route, 188; length of large and small, in children, 187; occlusion of, in tuberculous peritonitis, 278; fibroids, lipomata, dermoids, and polypi of, 368; congenital defects in mesentery causing obstruction of, 372; utility of rubber tubing in surgery of, 433
- Intratracheal insufflation of chloroform, 3
- Intussusception in course of typhoid fever, 188
- Iodine for disinfection of skin, 170
- Iridotomy, Method of performing, 72
- Iris, Treatment of prolapse of, following perforating wounds, 489
- Irrigation, Tidal, of wounds by liquid-tight closure, 257
- Ischæmia, Artificial, 299
- J**AUNDICE, Splenomegaly and, 120; surgical significance of, 206
- Jaws, Use of radium in carcinoma of, 353. *See also* Mandible, Maxilla
- Jejunum, Simple ulcer of, 15; cancer of angle of, with duodenum, 115; fistula involving, and colon following gastrojejunostomy, 277; ulcer of, following gastrojejunostomy, 368
- Joints, Osteitis causing loose bodies in, 122; syphilitic and tuberculous, 123; nutrition of cartilage of, 212; advantages of extension in treatment of diseased, 290; war wounds of major, 374. *See also* names of joints
- K**ERATOCONUS, Operation for, 328
- Keratosis, Solar, and cutaneous cancer, 34
- Kidney, Complications in pregnancy, 54; diagnosis of surgical lesions of, 65; calculus of, 66; infections of, in gynecological practice, 66; clinical considerations of tumors of, 67; epithelial hyperplasia in congenital cystic, 146; bacteriology of urine in tuberculosis of, 231; surgery of, 231; surgical anatomy of pelvis and calyces of, 322; diagnosis of tuberculosis of, 323; diagnosis, prognosis, and treatment of hæmorrhages from, 323; resection of double, 323; adenosarcomatous tumors of, 324; rare case of calculus of, 324; successful homotransplantation of, 388; relation of suppression of urine in pregnancy and puerperium to symmetrical necrosis of cortex of, 402; leukoplakia of pelvis of, 407; calculus of, with negative X-ray findings, 407; syphilis of, 408; conditions contra-indicating operation for stone in, 483; calculus in, 483; injections of silver nitrate into pelvis of, in treatment of essential renal hæmaturia, 484; formation of calculi about foreign bodies introduced into pelvis of, 487. *See also* names of kidney conditions and operations
- Knee, Torsion of, 123; neo-arthrodes of, 195; wounds and infections of, 285; 459. *See also* under joints
- L**ABOR, Tumors complicating, 54, 141; anæsthesia in, 58; infection of intestinal origin complicating, 141; syphilis and, 224; rupture of cæsarean scar during, 227; surgical methods of dilating cervix during, 319; treatment of second stage of, to prevent injury to child and pelvic floor, 404; rupture of vagina during, 405; twilight sleep in, 478
- Labyrinthine complications in middle ear suppurations, 239
- Laryngitis, Indifference of laryngologist toward tuberculous, 416
- Laryngofissure, Intrinsic cancer of larynx treated by, 419
- Laryngoscopy, Direct, 492
- Larynx, Papillomata of, in children, 75; thyrotomy in removal of subglottic epithelioma of, 75; angiomata of, 157; intrinsic cancer of, treated by laryngofissure, 419; treatment of tuberculosis of, with X-ray, 492
- Legs, Trophic changes in stumps of, 26; treatment of pseudarthrosis of, 201; tripod method of walking with crutches in complete paralysis of, 203; amputations of, 377. *See also* Limbs
- Leucocytes, Effect of ether anæsthesia and subcutaneous injections of ether on circulating, 171; circulating in blood after splenectomy, 370
- Leucorrhœa, Pathology and treatment of chronic, 311
- Leukoplakia of pelvis of kidney, 407
- Liability, Of physicians and surgeons, 137; of hospitals, for negligence of employees, 394
- Ligaments, Function, rupture, and operative treatment of crucial, 283; ready-to-wear brace for strained, 350; new method of approaching crucial, 378; mechanical arrangement and treatment of weaknesses of, of lumbar and pelvic regions, 464
- Limbs, Establishment of collateral vascular system in, 25; cases of surgery of, 288. *See also* Legs
- Lip, Squamous-cell epithelioma of, 7
- Liposarcoma, Retroperitoneal, 24
- Liver, Riedel's lobe of, complicating urological diagnosis, 67; subdiaphragmatic abscess due to abscess of, 120; primary cancer of, 190; obstruction of veins of, 280; unusual phases of syphilis of, 281; biliary factor in lesions of, 455; diagnosis and treatment of injuries of, 455; changes in tissue of, following splenectomy, 469; relation of, to urobilinuria, 486. *See also* names of liver conditions and operations
- Lumbago, Surgical operation for, 464
- Lungs, Anæsthesia in surgery of, 3; abscess of, following tonsillectomy, 76, 157; infarction of, following gynecological operations, 100; results of ether anæsthesia on tuberculosis of, 103; cause of abscess of, after tonsillectomy, 157; results of splenectomy in pernicious anæmia in tuberculosis of, 193; fatal postoperative thrombosis of, 435; glandular abscess of hilum of, 448; rôle of tonsils in tuberculosis of, 491. *See also* names of lung conditions and operations
- Lymphatic system, Involvement of regional, in experimental syphilis of rabbit, 389
- M**AGNESIUM metabolism in multiple cartilaginous exostosis, 387
- Magnet, Ring, 175
- Malignancy, And radiation, 34; cross-fire radium and X-ray therapy for inoperable, 307; lethal dose of radium in, 307, 470; erythema dosage of radium in, 470. *See also* under names of organs
- Mandible, Operative treatment of ununited fractures of, 8; treatment of war fractures of, 8; use of bone grafts in, 175, 354; osteomyelitis of, 262. *See also* Jaws

- Mastitis, Precancerous lesions of breast with special reference to chronic cystic, 180
- Mastoid, Early operative interference in acute suppurative affections of, 72; incomplete operation on, as cause of delayed healing, 72; unreliability of temperature in otitis of infants and children as an indication for operation on, 328; technique of simple operation on, 329
- Mastoidectomy, Blood-clot dressing in, 154
- Mastoiditis, And suboccipital Pott's disease, 240; symptomless influenzal streptococcal, 414
- Mastoidotomy, Preventive, 414
- Maxilla, Orbitopalatal route of transilluminating sinus of, 155; sinus of, in role of reservoir for overlying sinus disease, 155; principles of orthodontia in treatment of injuries of, and face, 175, 354; malignant tumors of antrum of, 242; chronic infective osteitis of, 332; comparative values of roentgenography and transillumination in diagnosis of disease of, 416; new form of sinusitis of, 417; complications of puncture of antrum of, 417. *See also* Jaws
- Meckel's diverticulum, Diagnosis of perforation of, 369
- Mediastinum, Emphysema of, 184; treatment of wounds of important vascular trunks of, 386
- Medulla oblongata, Relation between spinal fluid and, after gunshot injuries of skull, 440
- Membrana tympani, Relation of hypertension and hypotension of, to deafness and tinnitus, 414
- Menopause, Hypertension at, 222
- Menstruation, Conservation of, 314; after complete hysterectomy, 472; peritoneal, 474
- Mercuric chloride poisoning from vaginal injections, 222
- Mesentery, Cyst of, 24; thrombosis of, 372; congenital defects of, causing intestinal obstruction, 372
- Mesothorium, Results of, in treatment of carcinoma of genital organs, 476
- Metabolic rate in exophthalmic goiter, 125
- Military surgery, Application of principles of, to civil practice, 134
- Morphine and scopolamine narcosis in cesarean section, 318; report of cases, 478
- Mortality, Infant and child, 230; syphilis as cause of foetal, 481
- Mouth, Use of radium in carcinoma of, 353
- Muscle, Obturation of bone cavities with strips of, 200; regeneration of cells of smooth, 301
- Muscles, Ready-to-wear brace for strained, 350; treatment of atrophy of, by artificial stimulation, 379; mechanical arrangement and treatment of weakness of, of lumbar and pelvic regions, 464
- Mycosis of bovine and foetal membranes due to mould of genus *mucor*, 39
- Myelodysplasia, Disturbance of bladder in, 148
- Myxoma, Clinical considerations of, of kidney, 67
- NASOPHARYNX**, Primary carcinoma of, 155; sarcoma of, 418
- Nausea and vomiting of pregnancy, 317
- Neck, Treatment of wounds of important vascular trunks of, 386; congenital cysts of, 444
- Negligence, Contributory, of patient, 136; physical examination by physician in lawsuit cases for, in New York, 309; hospital liable for, of employees, 394; evidence of causal connection between, and injury, 394
- Neo-arthrodes of knee, 195
- Nephrectomy, Ideas with regard to, 232; secondary, 233; 324; in eclamptic anuria, 317
- Nephritis, Hæmaturia of chronic infectious focal, 68
- Nephrolithiasis, Pyelotomy in, 232
- Nephrostomy, Technique of, 484
- Nephrotomy, In eclamptic anuria, 317
- Nerve, Tenoplasty in paralysis of radial, 200; resection of branches of vagus, in treatment of gastric affections, 450; Barany rotation and caloric test in tumors of acusticus, 489
- Nerves, Diagnosis of function of, 206; present status of surgery of, 206; signs of injuries of, and regeneration in, 206; technique of suture of, 207; electrical stimulation of, at operation, 208; problems of surgery of, 260; technique of operations on peripheral, 292; effects of radium treatment of war injuries in neighborhood of, 307; blocking of, for nasal surgery, 330; relation of, of stomach to ulcer, 364; lesion of spinal sympathetic, 380; formication test in injuries of peripheral, 382; principles of surgery of peripheral, 382
- Neuralgia, *See* Trigeminal neuralgia
- Neurasthenia, Appendicostomy and cæcostomy for intestinal stasis in, 454
- Neurolabyrinthitis, Meningitic, 239
- Neuromata, Development and prevention of, following amputation, 383
- New-born, Feeding of, 61; newer knowledge of, 61; new method for determining coagulation time of blood in, 143; diphtheria endemics of, in obstetrical clinics, 320
- Nitrous oxide, In obstetrics, 142; continuous administration of, in dental surgery, 260
- Nose, External surgery of accessory sinuses of, 74; diagnosis and treatment of syphilis of, 156; anaesthesia for operations on, 170; etiology and treatment of humped, hooked, and bulbous, 175; effect of certain conditions of, on extrinsic muscles of eye, 238; surgical correction of aquiline or humped, 241; new procedures for correction of deformities of, 242; conservative surgery of sinuses of, 330; treatment of disease of accessory sinuses of, 330; ethmoidal operations for pan-sinusitis opening accessory sinuses of, 330; nerve blocking for surgery of, 330; original method of submucous operation on septum of, 416; advantages and disadvantages of various local anesthetics for operations on, 416; conservative operation on accessory sinuses of, 417; glioma of fossæ of, 418; clinical significance of bacteriological examination of accessory sinuses of, 491
- Novocaine anaesthesia, Disadvantages from surgical standpoint, 171
- OBSTETRICS**, Anaesthesia in, 58, 142; isolated compression of aorta to stop hæmorrhage in, 60; teaching of, 62, 63; use of nitrous oxide in, 142; and State, 145; spinal cocainization in operative, 259
- Occipitoposterior positions, Treatment of obstinate, 404; artificial rotation of head in, 59
- Œdema, Acute pulmonary, following tapping, 10
- Œsophagectasis in infant, 108
- Œsophagus, Cause of cancer of, 12; radium treatment of cancer of, under roentgen-ray control, 269; treatment of severe cicatricial strictures of, 362; diverticula of, 363; roentgen examination of, 448
- Olecranon, Fractures of, treated with Fischer's apparatus, 199
- Omphalitis, Frequency and significance of, 144
- Omphalomesenteric duct, Abnormalities resulting from remains of, 121
- Operation, Parent's refusal of, 309
- Opinion evidence as against positive testimony in lawsuit, 308
- Oriental sore, Histologic resemblance of, to epithelioma, 126
- Orthopedics, Operations found most satisfactory in department of, of University of Pennsylvania, 201; use and abuse of mechanical supports in, 202; notes on military, 290



- Os calcis, Fractures of, treated by means of Fischer's apparatus, 199
- Osteitis, Clinical course and pathology of, causing loose bodies in joints, 122
- Osteo-arthritis, Bearing of local putrefactions on, 120
- Osteochondritis deformans, Etiology of, 373
- Osteomalacia, Spread of, incident to hunger blockade in Prussia, 194; rare or common disease, 373
- Osteomyelitis, Acute, complicating epidemic influenza, 25; treatment of, 216; healing processes in conservative treatment of cystic, 462
- Otitis media, Suppurative, 153; labyrinthine complications in, 239; unreliability of temperature in, of infant: and children as indication for mastoid operation, 328; misleading conditions in acute suppurative, 414
- Ovary, Tuberculosis of cysts of, 31; importance of certain data in diagnosis of cysts of, 47; results of exposure of to rays of radium, 213; hæmorrhage from 219; primary and secondary carcinoma of, 220; homotransplantation of, 388; femoral hernia of, 397; essential varicocele of, 398; menstruation after complete hysterectomy due to uterine mucose in remaining, 472; tuberculosis of, 474
- Ovulation, Physiology of, 473
- Oxygen, Therapeutic use of, 388
- P**ANCREAS, Effect of partial removal of, 21; experimental chronic diabetes due to, 21; histogenesis of carcinoma of islets of, 119; diagnosis of disease of, 120; annular, 193; lithiasis of, and diabetes mellitus, 282; carcinoma of, 457
- Pancreatectomy, Partial, and experimental chronic pancreatic diabetes, 21
- Paranephritis, Disturbance of excursions of diaphragm in, as determined with X-ray, 110
- Parathyroid glands, Treatment of postoperative tetany by transplantation of, 1
- Parotid gland, Disinnervation of, 443
- Parovarium and its cystic degeneration, 397
- Patella, Fractures of, treated with Fischer's apparatus, 199
- Pelvis, Supporting floor of, to prevent and overcome uterine prolapse, 138; fractures of, 286; mechanical arrangement and treatment of weakness of muscles and ligaments of, 464; modular angle of normal, or geometrical, 482; obstruction of intestines due to exudates in, following gynecological operations and its prevention, 452
- Pennsylvania State prenatal and postnatal clinic, Report of work during past year, 64
- Perineorrhaphy, End-results in intermediate and secondary, 228
- Perineum, Plastic surgery of, 400
- Periostitis complicating epidemic influenza, 25
- Peritoneum, Absorption of solids by, 14; liposarcoma behind, 24; congenital cyst behind, arising from wolffian body, 24; disturbance of excursions of diaphragm in tuberculosis of, as determined by X-ray, 110; pseudomyxoma of, 184, 272; menstruation in, 474; X-ray treatment of tuberculosis of, in female, 474
- Peritonitis, Secondary enterostomy following operations for, 100; treatment of septic, 109; acute diffuse, 271; intestinal occlusion in tuberculous, 278; new method of diagnosing, in infancy and childhood, 449; management of general pelvic, 475
- Peroneal tendons, Operation for chronic dislocation of, 288
- Phagocytosis, New method of testing, with blood plasma, 35; in hypertrophic thyroid gland, 264; factors leading to, 302
- Physician, Privilege as to, employed prior to injury, 43; liability of, 214; ratification of employment of, 215; general and special employment of, 309; physical examination by, in lawsuits for negligence in New York, 309; care required in selecting and retaining, 309
- Pituitary gland, Surgery of, 105; histamine in extracts of posterior lobe of, 304; early diagnosis of tumor of, with ocular phenomena, 488
- Placenta prævia, Treatment of, by conservative measures, 56; hæmostasis in, centralis, 57
- Pleura, Effusion of, with inversion of diaphragm, 10; diagnosis of encapsulated effusions of, 358
- Pleurisy, Method of operating in purulent, 107; treatment of purulent, by closed drainage and continuous aspiration, 178
- Pneumatosis cystoides intestini hominis, 451
- Pneumectomy, Experimental, 11
- Pneumoperitoneum, Radiographic study of abdominal organs by, 42, 121, 282, 268, 283, 370, 371; to determine patency of fallopian tubes in sterility, 139; healing effect of, 458
- Polarized light, Use of, to detect suture material embedded in tissues, 212
- Polycythæmia in ulcer near pylorus, 451
- Position, Artificial rotation of head in persistent occipitoposterior, 59; treatment of obstinate occipitoposterior, 404
- Postmature child, 320
- Potassium mercuric iodide, Germicidal value, 101; use of, for skin disinfection, 102
- Pott's disease, Mastoiditis and suboccipital, 240
- Pregnancy, Rôle of carbohydrates in treatment of toxæmias of early, 52; influenza and, 53; encephalitis lethargica in, 53; temporization in ectopic, 54; tumors complicating, 54, 141; renal complications of, 54; infection of intestinal origin complicating, 141; care during, 144; syphilis in, 224, 481; treatment of hæmorrhage in, 224; appendicitis in, 224; toxæmias of, 226; in rudimentary horn of bicornate uterus, 226; primary abdominal, subsequent to cæsarean section, 226; rupture of cæsarean scar during, 227; diagnosis of ectopic, 317; nausea and vomiting of, 317; surgical methods of dilating cervix during, 319; circulatory disturbances of, 401; diet in, 401; suppression of urine in, 402; classical cæsarean section in treatment of certain forms of bronchopneumonia in, 402; effects of antityphoid vaccination in, 402; primary abdominal, 474; diastase content of urine in toxæmias of, 477; and tuberculosis, 477; management of acute appendicitis developing in latter weeks of, 478
- Premature infant, Problem of, 60
- Prenatal care from viewpoint of obstetrician, 144
- Presentation, Analysis of cases of breech, and method of delivery, 59
- Privileged communications in lawsuit, 137
- Prostate, Reducing mortality in operations on, 69; two years' work in treatment of conditions of, 150; organotherapy in hypertrophy and atrophy of, 151; significance of chronic vesiculitis in conditions of, 235; benign hypertrophy of, 327; lipoids of, 411; action of extracts of, on excised genito-urinary organs, 486
- Prostatotomy, 69, 151, 236, 441; after-treatment following, 236, 412; hæmorrhage and postoperative obstruction in suprapubic, prevented by open operation, 236
- Prostatism, Organotherapy of, 151
- Prostatitis, Clinical observation and treatment of chronic, 235
- Pseudarthrosis, Treatment of, of neck of femur by Albee's method, 201



Pseudarthroses, Treatment of, of leg, 201  
 Pseudo-appendicitis, Syndrome of, associated with dysentery, 115  
 Pseudomyxoma peritonei, 184; in male subjects, 272  
 Pterygomaxillary fossa, Extraction of foreign bodies in, 173  
 Puerperium, Infection of intestinal origin complicating, 141; tumors complicating, 54, 141; persistence of septicæmia in, 143; value of minimum pressure in prognosis of severe hæmorrhage in, 319; relation of suppression of urine in, to symmetrical necrosis of renal cortex, 402; non-interference in treatment of infections of, 405; prevention and treatment of sepsis in, 480  
 Purpura of urinary tract, 70  
 Pyelitis, 146  
 Pyelography, Sodium iodide as medium in, 391  
 Pyelotomy in nephrolithiasis, 232  
 Pylorus, Diagnosis and treatment of congenital stenosis of, 186; partial obstruction of, 187; prognosis in hypertrophic stenosis of, treated surgically, 110; congenital hypertrophic stenosis of, treated by Fredet-Rammstedt operation, 366; new, 366  
 Pyothorax, Trephine operation for, 9  
**R**ACHITIS, Spread of, incident to hunger blockade in Prussia, 194; treatment of deformities due to, in general practice, 203  
 Radium, Malignancy and, 34; technique of applying, to cataracts, 71; treatment of malignant tumors of thymus gland with, 108; treatment of enlarged thymus glands in infants with, 109; results of exposure of animal ovaries to, 213; treatment of malignant tumors with, 213; treatment of cancer of œsophagus with, under roentgen-ray control, 269; cross-fire, and X-ray-therapy for inoperable malignant disease, 307; treatment of war injuries near nerves with, 307; lethal dose of, in malignancy, 307; immediate after-effects of use of, for non-malignant uterine bleeding, 311; results of treatment of carcinoma of uterus with, 312; limitation of treatment of cancer of cervix with, 313; relative values of, and surgery in treatment of tumors of pelvic organs, 315; use of, in treatment of carcinoma of face, jaws, and oral cavity, 353; treatment of angiomas with, 393; treatment of carcinoma of cervix with, 396; treatment of carcinoma of uterus with, in Stockholm, 396; value of, in treatment of bladder tumors, 410; simple and efficient means of applying, to bladder neoplasms in male, 411; in toxic goiter, 446; lethal and erythema dosage of, in malignancy, 470; technique and indications for treatment of uterine carcinoma with, 472; results of use of, in treatment of carcinoma of genital organs, 476  
 Radius, Excision of, 25; acute osteomyelitis and periostitis of, following epidemic influenza, 25; treatment of fracture of, at middle third, 125  
 Ranula, Relationship between, and branchiogenetic cysts, 443  
 Raynaud's disease, 297  
 Records, Hospital, as evidence in lawsuits, 394  
 Red degeneration, Causation of, 219  
 Rectum, Stricture of, 17; aseptic amputation of, 18; anatomical considerations of prolapse of, in infants, 18; changes in mucosa of, following narcosis by ether given by, 171; X-ray treatment of cancer of, 190; plastic operations on, 369; cancer of, 369; diseases of, in young soldier, 453; surgical principles in treatment of fistulæ of, 454  
 Rheumatism, Surgical operation for sciatic, 464  
 Ribs, Cervical, 106, 176; scorbutic beading of, 268; fractures of, 375

Riedel's lobe of liver complicating urological diagnosis, 67  
 Roentgen ray, Examination of injuries of head, 4; end-results of treatment of cancer of breast before and after introduction of prophylactic treatment with, following operation, 10; relation of structure of cancer tissue to treatment with, 34; war lessons on use of, 39; treatment of tuberculosis, 40; treatment of neoplasms, 40; treatment of cancer, 40; studies of functional alterations of diaphragm, 41; study of great vessels, 41; study of abdominal organs after inflation of peritoneal cavity, 42, 121, 282, 283, 371; difficulties in interpretation of, findings in peptic ulcer, 42; release by patient not a bar to legal action for, burns, 43; cancer developing rapidly in uterine fibromata during treatment with, 45; demonstration with, of abnormalities of gastro-intestinal tract in children, 110; disturbances of excursions of diaphragm in peritoneal tuberculosis and paranephritis as determined by, 110; phenomena noted in appendix region, 133; studies of chronic intestinal stasis, 133; treatment of pruritis ani, 134; findings in tuberculous enterocolitis, 185; treatment of cancer of rectum, 190; treatment of surgical tuberculosis, 210; pathologic findings in, examination of digestive tract, 212; treatment of malignant tumors, 213; treatment of exophthalmic goiter, 266; radium treatment of cancer of œsophagus under control of, 269; in diagnosis of obscure conditions, 305; efficient dosage in deep therapy with, 306; filtered, dosage, 306; cross-fire radium and, therapy for inoperable malignant disease, 307; treatment of uterine fibromyomata, 312; scientific bases and technique of treatment of fibromyomata of uterus, 312; alveolar infections of dental origin as seen with, 332; removal of metallic foreign bodies by surgical operations under direct control of, 345; influence of, after operation for carcinoma of breast, 360; progress in examination of abdominal organs by means of pneumoperitoneum and, 370; physics of, 390; cause of burns due to, 392; essentials in use of, in dental work, 392; renal calculus with negative, findings, 407; comparative value of transillumination and, in diagnosis of diseases of frontal and maxillary sinuses, 416; examination of œsophagus, 448; diagnosis of gall-stones, 456; radical treatment of burns due to, 469; in treatment of peritoneal and genital tuberculosis in female, 474; in treatment of laryngeal tuberculosis, 492  
 Round ligament, Vaginal shortening of, with vaginofixation, 138; artery of, 390  
 Rubber tubing, Utility of, in intestinal surgery, 433; as factor in reaction to blood transfusion, 467  
**S**ACRUM, Fistulæ and cysts involving, and coccyx, 31  
 Saligenin, Local anæsthetic action of, 259  
 Salivary ducts, Calculi of, 332  
 Salpingitis and neoplasms in prolapse of uterus, 46  
 Schauta-Wertheim operation for genital prolapse, 50  
 Schoenmann clamp, Treatment of fractures with, 197  
 Scopolamine and morphine narcosis, For cæsarean section, 318; report of cases, 478  
 Scrotum, Primary experimental syphilitic infection of, of rabbit, 302  
 Semilunar meniscus, New method of approaching, 378  
 Seminal vesicles, Treatment of chronic inflammation of, in prostatic conditions, 235; surgical pathology of, 237; local treatment for inflammation of, 486  
 Serum treatment, Tetanus following, 37  
 Serum anitrypsin, Nature of, and its relation to autolysis and formation of toxins in infection and anaphylaxis, 132



- Sesamoid bones of great toe, Injuries of, 459
- Shock, Treatment of surgical, in zone of advance, 294; effects of anæsthetics in, 348
- Shoulder, Treatment of dislocation of, 27; habitual dislocation of, 286; value of posture in after-treatment of stiff, 290
- Sinus, Thrombosis in children, 7; conservative surgery of lateral, 153; orbitopalatal route for transilluminating maxillary, 155; maxillary, in rôle of reservoir for overlying disease, 155; new form of inflammation of maxillary, 417
- Sinuses, External surgery of nasal accessory, 74; diagnosis and prognosis of loss of vision due to disease of accessory, 242; conservative surgery of nasal, 330; ethmoid operation for pan-sinusitis opening accessory, 330; surgical treatment of disease of nasal accessory, 330; comparative value of roentgenography and transillumination in diagnosis of diseases of frontal and maxillary, 416; conservative operation on nasal accessory, 417; glioma of nasal, 418; clinical importance of bacteriological examination of nasal accessory, and ear, 491
- Skin, Solar keratoses and cancer of, 34; use of potassium mercuric iodide for disinfection of, 102; preparation of, for surgical operations, 169; practicability of iodine for disinfection of, 170; grafting of, 257
- Skull, Fever and fracture of, 5; repair of defect of, by new method, 100; operation to relieve pressure within, 172; extraction of foreign bodies from pterygomaxillary fossa of, 173; repair of defects of, with bone grafts, 260, 351; tuberculosis of, 351; perforating tumors of, 440; relation of spinal fluid to medulla oblongata after gunshot injuries of, 440; *See also* Head
- Sluder method of performing tonsillectomy used with local anæsthesia, 491
- Soaps in relation to hand washing, 347
- Sodium carbonate in chloroform poisoning, 305
- Sodium citrate, Anticoagulant action of, 467
- Sodium iodide, Use of, in pyelography, 391
- Sphenoid, Empyema of, and epidemic cerebrospinal fever, 155
- Spinal anæsthesia, Anhydrous cocaine, 104; in gynecology, 104; induced with cocaine in operative gynecology and obstetrics, 259; induced with stovaine, 438
- Spinal cord, Surgical treatment of tumors of, 30; diagnosis of tumors of, 205; early symptoms and diagnosis of diseases of, 201; meningeal tumor of, 464
- Spinal fluid, Significance of yellow, 129; relation between, and medulla oblongata after gunshot injuries of skull, 440
- Spine, Anæsthesia and surgery of, 2; treatment of fractures of, not associated with cord symptoms, 30; wounds involving head and, cared for at evacuation hospital, 173; treatment of tuberculosis of, 203
- Spirochætosus, Case of icterohæmorrhagic, 281
- Spleen, Traumatism of, 282; homeotransplantation and autotransplantation of, in rabbits, 389
- Splenectomy, In splenomegaly and jaundice, 120; results of, in pernicious anæmia, 193; study of blood after, 370; changes in hepatic tissue after, 469
- Splenic flexure, Carcinoma of, 117
- Splenomegaly and jaundice treated by splenectomy, 120
- Spondylitis and abdominal pain, 381
- Starvation osteopathies, Spontaneous fractures in, 26; in Munich, 31; clinical picture of, 31; spread of, incident to hunger blockade in Prussia, 194
- Stenon's duct, Treatment of fistulæ of, 443
- Sterility, 49; non-operative determination of patency of fallopian tubes in, by inflation of uterus with oxygen, 139
- Stomach, Polypoid adenoma of, 14; gastro-enterostomy the treatment of choice for chronic ulcer of, 15; difficulties in interpretation of roentgen-ray findings in ulcer of, 42; relation of arteries supplying, to ulcer, 111; new views on pathology, diagnosis, and treatment of ulcer of, 111; perforated ulcer of, 112; late results of surgical treatment of chronic ulcers of, 112; postoperative morbidity of ulcer of, 113; sarcoma of, 114; 186; common forms of tuberculosis of, and intestines, 185; carcinoma of, 186; surgery of urgent conditions of, 273; significance of etiological factors in treatment of ulcer of, 274; diagnosis, surgical management, and treatment by actual cautery of perforated ulcer of, 274; use of duodenal sound to examine secretion of, for occult bleeding ulcer of, 275; remote results of surgical treatment of ulcers of, 275, 365; surgical treatment of cancer of, 276; relation of innervation to etiology and treatment of ulcer of, 364; calloused ulcer of posterior wall of, 364; fibroids, lipomata, dermoids, and polypi of, 368; symptoms and therapy of ulcer of, 450; new points in treatment of ulcer of lesser curvature, 450; resection of branches of vagus nerve in treatment of affections of, 450; polycythæmia in ulcer of, near pylorus, 451
- Stovaine for spinal anæsthesia, 438
- Subdiaphragmatic abscess due to abscess of liver, 120
- Supports, Use and abuse of mechanical, in orthopedic conditions, 202
- Suppurations, Technique of drainage in, 434
- Suprarenal glands, Histopathologic study of, in tetanus intoxication, 469
- Surgery, Application of military, to civil practice, 134; and embryology, 383; anæsthesia in experimental, 388; accident, and secondary wound healing, 462
- Suture materials, Use of polarized light in investigation of, embedded in tissues, 212
- Sympathetic nervous system, Pathology of, 380
- Symphysiotomy, Subcutaneous, in Argentina, 479
- Syngeneic plastic transplantations, Results of various kinds of, in dependence upon relationship between donor and host, 302
- Syphilis, Gynecological affections in relation to, 49; experimental infection of testicle by, in rabbit, 130; and abortion, 142; in pregnancy and labor, 224; reaction in scrotum of rabbit to infection with, 302; local dissemination, local recurrence, and involvement of regional lymphatics by syphilis in rabbit, 389; reaction of eyes to, 414; reaction to, in women, 475; relation of, to prenatal care and foetal death, 481
- TEETH**, Consequences and treatment of sepsis of, in children, 76; why pulling of, fails, 77; foreign bodies originating in, in bronchus, 182; nitrous oxide in surgery of, 260; alveolar infections originating in, as seen by roentgenologist, 332; essentials in radiography of, 392
- Temperature, Unreliability of, in otitis of infants and children as indication for mastoid operation, 328; elevation of, in hand and forearm following excision of subclavian aneurism and ligation of subclavian and axillary arteries, 435
- Tendons, Operation for chronic dislocation of peroneal, 288
- Tendovaginitis, Stenosing, 283
- Tenoplasty in definite radial paralysis by, 200
- Testicle, Primary infection of, of rabbit with syphilis, 130; transplantation of, 412
- Testimony, Opinion evidence as against positive, in lawsuit, 308
- Tetanus, Following serum treatment, 37; postoperative, 129; treatment of, by combined intra-cranial, subdural, and intraspinal injection of antitoxin 212; histopathologic study of suprarenal glands in, 469



- Tetany, Treatment of postoperative, by transplantation of parathyroid glands, 1
- Thorax, *See* Chest
- Throat, Diagnosis and treatment of syphilis of, 156; anaesthesia for operations on, 170; advantages and disadvantages of local anaesthetics for operations on, 416
- Thrombosis, Sinus, in children, 7; venous, following gynecological operations, 100; progressing, in region of internal carotid following contusion and ligation, 263; mesenteric, 372; fatal postoperative pulmonary, 435
- Thumb, Plastic repair of, 376
- Thymoma, Case of malignant, 449
- Thymus, Treatment of malignant tumors of, with radium, 108; radium treatment of enlarged, in infants, 109
- Thyroid, Early diagnosis of malignant, 8; interrelation of, and hypophysis in growth and development of frog larva, 131; tuberculosis of, 264; compensatory hypertrophy of, 264; surgery of, 265; new method for diagnosis of toxic states of, 293; heterotransplantation of, 304; anaesthesia in operations on, 349, 436; new method of cauterizing, in treatment of exophthalmic goiter, 356; acute inflammations of, 444
- Thyroidectomy, Mistakes in, 356; emergency technique for, 357
- Thyrotomy for subglottic laryngeal epithelioma, 75
- Tibia, Fractures of, treated by plating operations, 28; osteitis fibrosa and bone cyst with congenital fracture of, 459; fracture of spine of, 461; fractures of, between ankle and middle third of, 461
- Tinnitus, Relation of hypertension and hypotension of membrana tympani to, 414
- Tissues, Cultivation of, 126; use of polarized light to detect suture materials embedded in, 212
- Toe, Injuries of sesamoid bones of great, 459
- Tonsillectomy, Lung abscess following, 76, 157; technique of, under local anaesthesia, 418; new technique for, 419; in adult under local anaesthesia by Sluder technique, 491
- Tonsils, Surgery of, 76; anaesthesia for operations on, 331; infections, 491; rôle of, in pulmonary tuberculosis, 491
- Toxæmias, Rôle of carbohydrates in treatment of, of early pregnancy, 52; of pregnancy, 226; recovers from chronic convulsive, following surgical correction of abdominal viscera, 371
- Trachelopexy in severe genital prolapse, 218
- Transillumination, Comparative values of surgery and, in diagnosis of diseases of frontal and maxillary sinuses, 416
- Trephination, Palliative, in cerebral conditions, 261
- Trichomonas vaginalis vaginitis, 48
- Trigeminal neuralgia, Injection of alcohol for, 106, 442; treatment of chronic paroxysmal, 174; major forms of, and surgical treatment, 442
- Tripod method of walking with crutches in complete paralysis of lower extremities, 203
- Tuberculosis, Fistula of anus due to, 18; of ovarian cysts, 31; treatment of, with X-rays, 40; common forms of gastro-intestinal, 185; partial antigen therapy in surgical, 210; X-ray treatment of surgical, 210; Freidmann's treatment of surgical, 383; indifference of laryngologist toward, of larynx and problem of, 416; treatment of surgical, with injections of turpentine, 468; of genital organs in female 474; X-ray treatment of peritoneal and genital, in female, 474; and pregnancy 477; diagnosis and treatment of, of genito-urinary tract, 486. *See also* under names of organs
- Tumors, Camphor-oil, 33; X-ray treatment of, 40; complicating puerperium, 54; complicating pregnancy, labor, and puerperium, 54; complete closure of urinary bladder after coagulation of, 68; mathematical terminology for, and its significance, 209; radiation of malignant, 213; of face, 442. *See also* under names of organs
- Turpentine, Treatment of surgical tuberculosis with injections of, 468
- Twilight sleep, Report of cases, 478
- Tympanomastoidean operation, Modern technique of, 415
- Tympanum, Rupture of, from shell explosions, 451
- Typhoid fever, Intussusception in, 188; effects of vaccination against, in pregnant women, 402
- ULCER, Physiological methods of treating varicose, 129; rodent, and allied growths, 209. *See also* under names of organs
- Ulna, Treatment of fracture of, and radius at middle third, 125
- Unskilled treatment of injuries, 261
- Ureter, Stone in, 233; cystic dilatation of vesical end of, 234; peristalsis and anti-peristalsis in, 303; differential diagnosis of obstruction of, from lesions of abdominal organs, 325; technique of removing calculi from, without operation, 325; diagnosis and treatment of calculus in pelvic portion of, 325, 484; contraction waves in normal and hydronephrotic, 409; conditions contra-indicating operation for stone in, 483; anastomosis of, 485
- Urethritis, 146
- Urethra, Gunshot wounds of, 148; plastic operation for stricture of, 149; prolapse of female, 326; strictures of large caliber, 411; treatment of most severe strictures and fistulae of male, 485
- Urinary tract, Purulent affections of, in nursing infants, 151; purpura of, 70
- Urine, Bacteriology of, in renal tuberculosis, 231; treatment of incontinence of, in women, 234; relation of suppression of, in pregnancy and puerperium to symmetrical necrosis of renal cortex, 402; diastase content of, in toxæmias of pregnancy, 477
- Urobilinuria, Enterohepatic theory of, 486
- Uterus, Cancer developing rapidly in fibromata of, during radiotherapy, 45; malignant myomata and related tumors of, 45; salpingitis and neoplasms in prolapse of, 46; Schauta-Wertheim operation for prolapse of, 50; puncture of, in hydramnion, 59; supporting pelvic floor to prevent and overcome prolapse of, 138; inguinal hernia of, 138; inflation of, to determine patency of fallopian tubes in sterility, 139; lipolysis of fibromyomata of, 139; rational treatment of carcinoma of, 139; inferior segment and "contracture" of gravid and parturient, 142; total inversion of parturient, 142; surgical treatment of prolapse of, 218; chronic infections of, 219; pregnancy in rudimentary horn of bicornate, 226; prolapse of, 311; immediate after-effects of use of radium for non-malignant bleeding from, 311; radiotherapy of fibromyomata of, 312; results of radium treatment of carcinoma of, 312; scientific bases and technique of radiotherapy of fibromyomata of, 80, 312; limitations of radium treatment of cancer of cervix of, 313; surgical methods of dilating cervix of, during pregnancy and labor, 319; carcinoma of stump of cervix of, after supravaginal hysterectomy and radium treatment of carcinoma of cervix of, 396; relation of hyperplasia of endometrium to so-called functional bleeding of, 396; treatment of carcinoma of, with radium in Stockholm, 396; sacculatation of gravid bicornate, 396; congenital absence of vagina and, in light of more recent endocrine studies, 399; technique and indications for radium therapy for carcinoma of, 472; adenomyoma of, with stroma but no glands, 472; curettage of, 472; total hysterectomy for fibroid tumors of, 473; use of mesothorium and radium in treatment of carcinoma of, 476
- Uveal tract, Pseudotumors of, 328

**V**ACCINATION, Effects of antityphoid on pregnant women, 402

Vagina, *Trichomona* of, 48; local anæsthesia in operations on, 49; shortening of round ligaments with fixation in 138; surgical treatment of prolapse of, 218; drainage through, 220; operative treatment of fistulæ involving bladder and, 221; mercuric chloride poisoning from injections into, 222; lateral intestinal anastomosis through, 276; congenital absence of, in light of more recent endocrine studies, 399; rupture of, during labor, 405

Vaginitis, *Trichomonas vaginalis*, 48; gonorrhœal, in children, 313

Varicocele, Essential tubo-ovarian, 398

Veins, Obstruction of hepatic, 280

Venous thrombosis, pulmonary infarction, and embolism following gynecological operations, 100

Verruca vulgaris, Etiology and biology of, 33

Vertebra, Bony changes in feet following fracture of, 124; sacralization of fifth lumbar, 381

Vesicovaginal fistula, Operative treatment of, 221

Vesiculitis, Significance of chronic, of prostatic conditions, 235

Vestibule, Anatomical features of, 239

Vision, Loss, from accessory sinus disease, 242

Vitreous, Removal of non-magnetic foreign bodies from, 71

Vomiting, Nausea and, of pregnancy, 317; from surgical viewpoint, 346

Vulva, Voluminous tumors of, 313

**W**ALKING, Tripod method of, 203

War lessons for radiology, 39

Wassermann reaction and miscarriages, 142

Wolfian body, Retroperitoneal congenital cyst arising from, 24

Workmen's compensation before and after amputation, 215

Wrist, End-results of resection of, 375

**X**-RAY, *See* Roentgen rays



## INDEX OF BIBLIOGRAPHY

### GENERAL SURGERY

#### *Surgical Technique*

- Operative Surgery and Technique, 78, 159, 244, 333, 420
- Aseptic and Antiseptic Surgery, 78, 159, 244, 333, 420
- Anæsthesia, 78, 159, 244, 333, 420
- Surgical Instruments and Apparatus, 78, 159, 244, 333, 420

#### *Surgery of the Head and Neck*

- Head, 78, 160, 244, 333, 421
- Neck, 79, 160, 245, 334, 421

#### *Surgery of the Chest*

- Chest Wall and Breast, 79, 160, 245, 334, 421
- Trachea and Lungs, 79, 160, 246, 334, 421
- Heart and Vascular System, 160, 334, 422
- Pharynx and Oesophagus, 79, 160, 246, 335, 422
- Miscellaneous, 79, 161, 246, 335, 422

#### *Surgery of the Abdomen*

- Abdominal Wall and Peritoneum, 80, 161, 246, 335, 422
- Gastro-Intestinal Tract, 80, 161, 246, 335, 422
- Liver, Gall-Bladder, Pancreas, and Spleen, 81, 162, 247, 336, 423
- Miscellaneous, 81, 162, 247, 336, 423

#### *Surgery of the Extremities*

- Diseases of the Bones, Joints, Muscles, Tendons, Etc., 81, 162, 248, 337, 424
- Fractures and Dislocations, 82, 163, 248, 337, 424
- Surgery of the Bones, Joints, Muscles, Tendons, Etc., 82, 163, 249, 337, 424
- Orthopedics in General, 82, 163, 249, 338, 425

#### *Surgery of the Spinal Column and Cord*

- Diseases and Deformities of the Spine, 82, 249, 338, 425

#### *Surgery of the Nervous System*

- Diseases and Surgery of the Nerves, 82, 249, 338, 425

#### *Miscellaneous*

- Clinical Entities—General Physiological Conditions, 82, 163, 250, 338, 425
- Sera, Vaccines, and Ferments, 164

- Blood, 83, 164, 250, 339, 426
- Blood and Lymph Vessels, 83, 164, 250, 339, 426
- General Bacterial Infections, 83, 164, 250, 426
- Surgical Diagnosis, Pathology, and Therapeutics, 164, 251, 339, 426
- Experimental Surgery and Surgical Anatomy, 83, 164, 251, 339, 426
- Roentgenology and Radium Therapy, 83, 164, 251, 339, 426
- Military Surgery, 84, 164, 251, 340, 427
- Industrial Surgery, 84, 164, 251, 340, 427
- Hospitals; Medical Education and History, 81, 164, 251, 340, 427
- Legal Medicine, 84, 165, 251, 340, 427

### GYNECOLOGY

- Uterus, 84, 165, 252, 340, 427
- Adnexal and Peri-Uterine Conditions, 84, 165, 252, 341, 427
- External Genitalia, 85, 165, 252, 341, 428
- Miscellaneous, 85, 165, 252, 341, 428

### OBSTETRICS

- Pregnancy and Its Complications, 85, 166, 252, 341, 428
- Labor and Its Complications, 86, 166, 253, 341, 428
- Puerperium and Its Complications, 86, 166, 253, 342, 428
- New-Born, 86, 166, 253, 342, 429
- Miscellaneous, 86, 166, 253, 342, 429

### GENITO-URINARY SURGERY

- Adrenal, Kidney, and Ureter, 86, 166, 253, 342, 429
- Bladder, Urethra, and Penis, 86, 167, 254, 343, 429
- Genital Organs, 87, 167, 254, 343, 429
- Miscellaneous, 87, 167, 254, 343, 430

### SURGERY OF THE EYE AND EAR

- Eye, 87, 167, 254, 343, 430
- Ear, 87, 168, 255, 343, 430

### SURGERY OF THE NOSE, THROAT, AND MOUTH

- Nose, 88, 168, 255, 344, 431
- Throat, 88, 168, 256, 344, 431
- Mouth, 88, 168, 256, 344, 432





# INDEX OF AUTHORS

- Abel, J. J., 304  
 Adair, F., 447  
 Ahumada, J. C., 49  
 Aikins, W. H. B., 446  
 Aimes, A., 278  
 Albray, R. A., 392  
 Alvarez, W. C., 42  
 Ammarell, W. H., 461  
 Anglade, 418  
 Apolloni, G., 282  
 Appleton, P., 58  
 Armstrong, M., 491  
 Arnold, I. A., 26  
 Ascoli, M., 130  
 Ashurst, A. P. C., 358  
 Atkinson, D. T., 415  
 Axtell, W. H., 453  
 Babcock, W. W., 29, 169  
 Bach, E., 132, 302  
 Bailey, C. F., 345  
 Baisch, K., 312  
 Baker, W. H., 219  
 Balard, P., 319  
 Baldwin, J. F., 399  
 Balfour, D. C., 433  
 Ballenger, E. G., 148  
 Barcroft, J., 388  
 Barnes, A. R., 478  
 Barney, J. D., 231  
 Barnhill, J. F., 265  
 Barolin, F., 219  
 Barrett, 63  
 Barron, M., 121  
 Bartlett, W., 357  
 Bassler, A., 191  
 Bastos Ansart, M., 201  
 Bauermeister, W., 133  
 Bazin, A. T., 285  
 Becerro de Bengoa, R., 47  
 Beer, E., 18  
 Behan, R. J., 129  
 Behrend, M., 25  
 Bell, W. B., 218, 227, 314  
 Bellin, 173  
 Benedetti, U., 193  
 Benedict, W. L., 488  
 Beninde, 194  
 Benjamin, A. E., 2  
 Berkeley, W. N., 293  
 Berry, F. B., 301  
 Berry, M. D., 436  
 Beust, A. T., 459  
 Bevan, A. D., 117, 368  
 Bier, A., 195  
 Biggs, M. H., 184  
 Bing, H. I., 451  
 Bircher, E., 450  
 Blaisdell, F. E., 237  
 Bland, P. B., 48, 222  
 Bland-Sutton, 189, 368  
 Blank, G., 384  
 Bloch, M., 467  
 Block, F. B., 139  
 Boas, J., 190  
 Boden, A., 31  
 Bogert, L. J., 387  
 Boggs, R. H., 307, 470  
 Bohmansson, G., 114  
 Bolognesi, G., 25  
 Bolton, C., 277  
 Bonn, H. K., 147  
 Bonney, V., 480  
 Boorstein, S. W., 229  
 Boribarn-Wetchagit, 398  
 Borschgrevinc, O., 377  
 Bouman, H. A. H., 8  
 Bouquet, H., 313  
 Bourne, A. W., 226  
 Braasch, W. F., 65, 483  
 Bradley, W. N., 61  
 Brandão Filho, A., 378  
 Braun, 383  
 Brewitt, R., 452  
 Bride, J. W., 225  
 Briggs, H. H., 155, 416  
 Broders, A. C., 7, 264  
 Brodhead, G. L., 226  
 Brown, W. H., 130, 302, 389  
 Brunner, A., 350  
 Bryan, L., 124  
 Bryant, F., 34  
 Bugbee, H. G., 54, 411  
 Bulkley, L. D., 295  
 Bullock, F. D., 131  
 Bullrich, R. A., 12  
 Bunts, F. E., 360  
 Burke, N. H. M., 208  
 Burns, R., Jr., 144  
 Burrows, E. C., 185  
 Burrows, W. F., 185  
 Busman, G. J., 467  
 Butler, T. H., 175  
 Cade, A., 115  
 Calcagno, B. N., 181  
 Cameron, J. F., 391  
 Campbell, W., 461  
 Canfield, R. B., 491  
 Carling, J., 124  
 Carman, R. D., 185  
 Carpenter, E. R., 490  
 Carrié, P. A., 486  
 Carro, S., 456  
 Carter, W. W., 175  
 Case, J. T., 100  
 Casler, D. B., 472  
 Casper, L., 323  
 Cassamajor, L., 353  
 Cates, B. B., 14  
 Cathey, G. A., 172  
 Cattell, M., 348  
 Chacul, H., 190  
 Chaliér, A., 398  
 Champay, C., 126  
 Chapman, H. S., 195  
 Charlton, W., 193  
 Chase, I. C., 454  
 Chassot, 474  
 Chauvin, E., 31  
 Chavanne, F., 415  
 Christie, J. M., 290  
 Chubb, G., 354  
 Churchman, J. W., 149  
 Chute, A. L., 233, 324, 413  
 Clapp, C. A., 238  
 Clark, C. M., 157  
 Clark, J. G., 315  
 Cleland, J. B., 209  
 Clendening, L., 157  
 Clift, M. W., 4  
 Climenko, H., 205  
 Coakley, C. G., 74  
 Coburn, R. C., 1, 142  
 Coca, F., 126  
 Cocke, N. P., 478  
 Coffey, R. C., 15  
 Cohn, I. M., 190  
 Coleman, C. C., 292, 351  
 Coley, W. B., 458  
 Colston, J. A. C., 148  
 Colvin, A. R., 122  
 Connor, E. L., 282  
 Cooper, G., 379  
 Cope, Z., 16  
 Corkery, J. R., 192  
 Corlette, C. E., 24  
 Cornell, E. L., 224  
 Cosens, W. B., 12  
 Costantini, H., 361, 386  
 Coventry, W. A., 311  
 Creadick, A. N., 144  
 Crile, G. W., 369, 446, 460  
 Crosbie, A. H., 486  
 Crowell, A. J., 325  
 Culbertson, C., 475  
 Cullom, M. M., 418  
 Curtis, A. H., 311  
 Cushing, H., 442  
 Dachtler, H. W., 332  
 DaCosta, J. C., 2  
 D'Agostini, F., 369  
 Dalmazzoni, S., 107  
 Danforth, W. C., 66  
 Davies, B. C., 75, 419  
 Davis, C. B., 106  
 Davis, C. H., 317  
 Davis, E. P., 141, 144  
 Davis, G. E., 154  
 Davis, J. S., 469  
 Day, R. V., 326  
 Deaver, J. B., 114  
 Deavor, T. L., 412  
 Decker, R., Jr., 370  
 Dederer, C., 388  
 DeForest, H. P., 297  
 DeGastano, L., 444  
 DeLee, J. B., 48, 404  
 Delassus, A., 218  
 Delbet, P., 178  
 Delitala, F., 26  
 Delmas, P., 259  
 DeMartel, T., 367  
 Demelin, L., 142  
 Demmer, F., 441  
 Denzer, B., 449  
 DePuy, E. S., 69  
 DeRaffele, F., 262  
 DeRom, 400  
 Desfosses, P., 375  
 Detré, G., 312  
 Deve, F., 383  
 Devic, A., 115  
 Dickie, J. K. M., 239  
 Dieffenbach, W. H., 373  
 Dietrich, H. A., 476  
 Dillon, J. R., 237  
 Dougal, D., 225  
 Douglas, J., 186  
 Downes, W. A., 363, 366  
 Drachter, R., 262  
 Ducroquet, C., 379  
 Dujarier, C., 201  
 Dunet, C., 398  
 Dunn, G. R., 11  
 Dupuy, H., 155  
 Dutrey, J., 14  
 Duval, P., 450  
 Dwyer, H. L., 25  
 Earl, G., 449  
 Eastman, J. R., 349  
 Eberle, D., 212  
 Eby, J. D., 175  
 Eden, T. W., 62  
 Egana, A., 437  
 Ehrlich, S. D., 102  
 Eikenbary, C. F., 285  
 Einhorn, M., 370  
 Eisendath, D. N., 13, 280, 323  
 Eisenstaedt, J. S., 68, 233  
 Elder, J. M., 24  
 Elder, O. F., 148  
 Elliott, I. H., 477  
 Ellis, A. G., 398  
 Elmer, W. G., 201  
 Elsborg, C. A., 30  
 Ely, L. W., 374  
 Embleton, D., 155  
 Emerson, N. W., 55  
 Emmel, V. E., 36  
 Engelbach, W., 293  
 Erdman, S., 332  
 Erdmann, J. F., 282  
 Evans, N., 45  
 Evans, W. G., 142  
 Ezquierdo, A., 46  
 Fagge, C. H., 150  
 Fagioli, A., 130

- Fasano, M., 117  
 Faure, J. L., 313  
 Ferrarini, G., 443  
 Finsterer, H., 455  
 Fisch, M. E., 36  
 Fischel, E., 353  
 Fischer, O., 380  
 Fischer, H. A., 102  
 Fitz, R., 2  
 Fleming, G. B., 457  
 Fleuster, 197  
 Flint, E. R., 278  
 Foerster, A., 110  
 Foldes, D., 199  
 Foot, N. C., 449  
 Forgue, E., 31  
 Formigini, B., 146  
 Forrester-Brown, M., 206  
 Fort, F. T., 286  
 Fowler, O. S., 325  
 Francis, L. M., 71  
 Frank, L., 396  
 Fraser, 324  
 Fraser, J., 32, 324, 239  
 Frassi, L., 234  
 Fravel, R. C., 118  
 Frazier, C. H., 176, 206, 445  
 Frederick, E. V., 45  
 Freiberg, A. H., 459  
 Frers, A., 57  
 Friedberg, S. A., 492  
 Fromme, A., 203  
 Furness, W. H., 385  
  
 Gabriel, W. B., 347  
 Gallie, W. E., 286  
 Galloway, H. P. J., 376  
 Garrod, A. E., 120  
 Gauss, C. J., 60  
 Gehl, W. H., 234  
 Gellhorn, G., 475  
 Geraghty, J. T., 410  
 Gérard, M., 317  
 Gibson, C. L., 189  
 Gillon, G. G., 366  
 Girdlestone, G. R., 196  
 Girode, C., 178  
 Givens, M. H., 52  
 Glass, E., 468  
 Goethals, T. R., 173  
 Goetsch, E., 208  
 Goldbloom, A., 110  
 González, J. B., 482  
 Goodloe, A. E., 439  
 Goodman, H., 142  
 Gording, R., 417  
 Gordon, W., 295  
 Goulden, C., 489  
 Graham, E. A., 305  
 Graham, G. S., 128  
 Grant, W. W., 397  
 Graves, W. P., 311  
 Gray, A. A., 239  
 Green, A. S., 328  
 Green, L. D., 328  
 Greenwood, A., 153  
 Grégoire, R., 200  
 Griffiths, G. H. C. S., 171  
 Guedel, A. E., 103  
 Guerin-Valmale, 402  
  
 Guisez, J., 362  
 Guthrie, D., 156  
 Gwathmey, J. T., 3, 331  
  
 Haeller, J., 468  
 Haggard, H., 1  
 Haggard, W. D., 355  
 Hall, M. W., 370  
 Halsted, H., 59, 435  
 Hamel, O., 31  
 Hamer, H. G., 150  
 Hamilton, H. C., 298  
 Hammer, A. W., 346  
 Hammond, F. C., 400  
 Hampton, H. H., 100  
 Hansen, I., 396  
 Hanson, A. M., 173  
 Hardt, A. F., 186  
 Hardy, W. F., 414  
 Harris, W., 174  
 Hart, D. B., 143  
 Hathaway, F., 178  
 Hawk, P. B., 2  
 Hay, P. J., 488  
 Haynes, D. J., 236  
 Hays, H. M., 414  
 Hedblom, C. A., 182  
 Heineberg, A., 472  
 Henderson, M. S., 29  
 Henderson, Y., 1  
 Hepburn, W. G., 438  
 Herrick, F. C., 323  
 Herrick, W. W., 401  
 Hertzka, E., 375  
 Hess, A. F., 268  
 Hesselberg, C., 264  
 Heublein, A. C., 109  
 Heuer, G. J., 11, 115  
 Hewitt, H. M., 169  
 Hey, R., 451  
 Heyer, 31  
 Hey-Groves, E. W., 197, 283  
 Hill, C. G., 414  
 Hill, F. T., 72  
 Hirsch, E. F., 24  
 Hirschfelder, A. D., 259  
 Hirschman, L. J., 18  
 Hoffmann, G. L., 52  
 Hoffmann, K., 224  
 Hoffmann, W. H., 150  
 Hohlbaum, J., 372  
 Holding, A. F., 296  
 Holland, C. T., 39  
 Holland, E. L., 227  
 Holltz, E., 320  
 Homans, J., 263  
 Honeij, J. A., 176, 387  
 Hoover, C. F., 280  
 Horgan, E. J., 119  
 Horsley, J. S., 179  
 Hoskins, E. R., 131  
 Hoskins, M. M., 131  
 Hubeny, M. J., 266  
 Huber, G. C., 383  
 Huessy, P., 213  
 Huggins, R. R., 129  
 Hughes, B., 27, 271  
 Hunt, V. C., 327  
 Hurst, A. F., 111  
 Hutchins, C. P., 123  
  
 Hutchinson, H. S., 457  
 Hutchinson, W., 66  
 Hyman, A., 407  
  
 Irving, F. C., 318  
 Ittelson, M. S., 330  
 Ives, R. F., 385  
 Ivy, R. H., 8, 354  
  
 Jackson, C., 360  
 Jackson, E., 238, 328  
 Jackson, J. N., 447  
 Jacobson, V. C., 146  
 Janeway, H. H., 108  
 Jardine, R., 402  
 Jean, G., 448  
 Johanson, N. A., 464  
 Jones, C. C., 153  
 Jones, E., 28, 197  
 Jones, E. O., 287  
 Jones, S. F., 461  
 Jordan, A. C., 133  
 Jorge, J. M., 261  
 Josselin de Jong, 368  
 Judd, E. S., 221, 231, 363, 446  
 Julliard, C., 289  
  
 Kaestle, C., 458  
 Kanaval, A. B., 442  
 Keene, F. E., 147  
 Kehrner, E., 313  
 Keiffer, H., 139  
 Kelly, R. E., 288  
 Kennedy, A. M., 402  
 Kerley, C. G., 110  
 Kerr, H. H., 261  
 Keyes, E. L., 152  
 Kidd, F., 484  
 Kiger, W. H., 18  
 Kimball, O. P., 355  
 Kimbrough, J. S., 269  
 King, E. L., 405  
 Kinoshita, M., 411  
 Klemptner, L., 416  
 Klose, H., 444  
 Kolischer, G., 68, 233, 409  
 Kosmak, C. W., 56  
 Krabbel, M., 119, 457  
 Krehbiel, O., 129  
 Kreider, G. N., 100  
 Kreissl, F., 234  
 Kroh, F., 440  
 Kummer, E., 115  
  
 Labbé, M., 486  
 Lackie, J. L., 59  
 Lacouture, J., 226  
 Lahey, F. H., 356  
 Lahm, W., 313  
 Landau, H., 210  
 Landois, F., 1  
 Lane, W. A., 290  
 Langfeldt, E., 21  
 Langmead, F., 108  
 Lanza, C., 397  
 Larimore, L. D., 455  
 Law, A. A., 374  
 Lawrence, C. H., 466  
 Lawrence, H., 307  
  
 Lee, B. J., 447  
 Lee, W. E., 258, 385  
 Legueu, F., 232  
 Lemon, C. H., 125  
 Lenormant, C., 351  
 Leotta, N., 15  
 Lespinasse, V. D., 486  
 Lett, H., 483  
 Leveuf, J., 115  
 Levin, I., 71  
 Levinson, S. A., 36  
 Lewis, D., 382, 383  
 Lewis, H. F., 317  
 Ley, G., 220  
 Lick, M., 151  
 Lilienthal, H., 359  
 Little, J. W., 139  
 Lobenhoffer, W., 40  
 Lockhart-Mummery, P., 116  
 Loeb, L., 264, 294, 299, 302, 304  
 Lotsch, F., 462  
 Love, P. J. M., 465  
 Lovett, R. W., 203  
 Lundholm, A., 259  
 Lydston, G. F., 411  
 Lyon, B. B. V., 20  
  
 Macadam, W., 126  
 MacCarty, W. C., 192, 209  
 MacFarlan, D., 101  
 Macht, D. I., 486  
 Mackay, C., 290  
 MacLennan, A., 260  
 MacMillan, A. S., 23  
 MacNider, W. D., 388  
 Magnus, G., 203  
 Manley, O. T., 389  
 Mann, F. C., 388  
 Manson, F. M., 9  
 Marine, D., 355, 389  
 Marion, G., 235  
 Marks, H. J., 239  
 Marshall, H. W., 30, 202, 350, 464  
 Marsiglia, G., 122  
 Martin, C. L., 41  
 Martius, H., 49  
 Mason, J. M., 478  
 Mason, J. T., 356  
 Massart, R., 200  
 Mathé, C. E., 235  
 Mathes, P., 57  
 Matsumoto, S., 486  
 Matsuoko, Y., 488  
 Maury, J. M., 213  
 Mayer, E., 416  
 Maylard, A. E., 187  
 Mayo, C. H., 296, 378, 445  
 Mayo, W. J., 23, 314, 364  
 Mayou, M. S., 72  
 Mazer, C., 313  
 McClure, C. W., 42  
 McConnell, A. A., 120, 191  
 McCoy, J. N., 34  
 McCrae, T., 10  
 McCurdy, S. L., 122  
 McGlannan, A., 107  
 McGuire, S., 188  
 McIlwraith K. C., 145



- McKenna, W. F., 102  
 McKinley, C. A., 146  
 McKinney, R., 491  
 McNeile, O., 228  
 Meehan, A. V., 377  
 Melchior, E., 100  
 Mellon, R. R., 387  
 Meyenburg, von, 263  
 Meyer, H., 376  
 Meyer, W., 447  
 Meyerding, H. W., 203  
 Michaelsson, E., 408  
 Miller, A. H., 37  
 Miller, O. R., 289  
 Mills, R. W., 269  
 Milone, C., 384  
 Mitchell, G. A., 61  
 Mocquot, P., 361  
 Molesworth, H. W. L., 195  
 Molla, R., 67  
 Monahan, J. J., 460  
 Moore, W. H., 33  
 Morand, P., 45  
 Morax, 489  
 Moreton, A. L., 188  
 Mornard, P., 312  
 Mosti, R., 118  
 Moszkowicz, L., 360  
 Mott, C. H., 3  
 Mott, F. W., 291  
 Mouchet, A., 288  
 Moynihah, B., 182  
 Muecke, F. F., 414  
 Muehlmann, E., 40  
 Muehsam, R., 116  
 Mueller, M., 474  
 Mullin, W. V., 416  
 Mummery, S., 261  
 Myers, A., 30  
 Myers, V. C., 211  
  
 Nagayama, T., 304  
 Nammack, C. H., 129  
 Naussauer, M., 485  
 New, G. B., 157, 242  
 Newcomet, W. S., 393  
 Noah, H. G., 76  
 Norrgard, H., 259  
 Norris, C. C., 64  
 Northrop, H. L., 12  
 Norton, J. F., 347  
 Notkin, S. J., 409  
 Novak, E., 14, 396  
 Novaro, N., 276  
 Nové-Josserand, G., 381  
  
 Ochsner, A. J., 151, 435, 441  
 O'Connor, R., 71  
 O'Connor, V. J., 67, 303  
 O'Hare, J. P., 37  
 Ohler, W. R., 294  
 Ollerenshaw, R., 286  
 Olow, J., 319  
 O'Neil, R. F., 68  
 Oppenheimer, S., 7, 241  
 Orndorff, B. H., 282  
 Orr, H. W., 125  
 Otani, M., 35  
 Owen, W. B., 459  
  
 Paddock, C. E., 401  
 Palermo, A. M., 2  
 Palmer, A. C., 405  
 Pancoast, H. K., 41  
 Pantolini, M., 397  
 Paramore, R. H., 219  
 Paterson, H. J., 275  
 Pattee, J. J., 414  
 Pauchet, V., 117, 276  
 Paul, N., 209  
 Pearce, K., 130, 302, 389  
 Pearson, W. W., 74  
 Peltesohn, S., 196  
 Pember, J. F., 257  
 Pemberton, J. D., 298  
 Pena Galarza, 104  
 Penfield, W. G., 409  
 Perrier, C., 326  
 Perthes, G., 10, 373  
 Peters, J. P., 70  
 Peterson, R., 485  
 Pfahler, G. E., 305  
 Philip, 418  
 Piccardo, T. J., 50  
 Piersol, G. M., 208  
 Player, L. P., 235  
 Plondke, F. J., 220  
 Plummer, W. A., 264  
 Polak, J. O., 473  
 Pollock, L. J., 206  
 Portmann, G., 240  
 Power, D., 346  
 Prat, D., 192  
 Prat, L., 188, 257  
 Pratt, J. A., 74  
 Presa y Vazquez, J. L., 8  
 Prusik, B. K., 386  
 Pujol, J. T., 440  
 Pust, W., 138  
  
 Quadri, A., 75  
 Quain, E. P., 349  
  
 Racchiusa, S., 281  
 Rail, W. A., 260  
 Ramdohr, P., 492  
 Rapp, H., 210  
 Rath, H., 462  
 Rauenbusch, 197  
 Ravdin, I. S., 114  
 Rayner, H. H., 106  
 Razzaboni, C., 38  
 Reaves, R. G., 330  
 Reaves, W. P., 330  
 Reed, C. A. B., 320  
 Reed, C. A. L., 371  
 Reeder, J. D., 17  
 Reeves, T. B., 111  
 Reh fuss, M. E., 19  
 Reid, M. R., 38, 263  
 Reinle, G. G., 69  
 Remer, J., 306, 392  
 Rendu, A., 381  
 Reschke, K., 283  
 Revel, I., 291  
 Reynolds, L., 42  
 Rich, A. R., 328  
 Richardson, E. P., 116  
 Richey, D. G., 407  
 Riesman, D., 10  
  
 Risdon, E. F., 175  
 Riviere, M., 226  
 Robbin, L., 187  
 Roberts, P. W., 123, 375  
 Robins, C. R., 222  
 Robinson, M. R., 399  
 Rodda, F. C., 143  
 Rodman, J. S., 180  
 Rodriguez, 437  
 Roeder, C. A., 107  
 Rogers, J. B., 171  
 Rohdenburg, G. L., 131  
 Rohleder, 151  
 Rolleston, H., 118  
 Rose, E. L., 103  
 Rosenthal, E., 450  
 Ross, E. M., 258  
 Ross, G. G., 372  
 Rothschild, N. S., 64  
 Rott, O. M., 72  
 Rous, P., 455  
 Roussiell, M., 211  
 Roy, D., 418  
 Royster, H. A., 138  
 Rubin, I. C., 139  
 Rulison, E. T., 16  
 Russell, R. H., 363  
 Rytina, A. G., 484  
  
 Sabucedo, C., 469  
 Sachs, E., 260, 352  
 Salzman, S. R., 491  
 Sandiford, I., 125  
 Saner, F. D., 124  
 Santi, E., 234  
 Sargent, P., 105  
 Sarria, P. A., 462  
 Saul, E., 33  
 Sautter, C. M., 329  
 Savignac, R., 171  
 Schley, W. S., 271  
 Schmitz, H., 472  
 Schneider, C. C., 435  
 Schochet, S. S., 473  
 Scholl, A. J., Jr., 210  
 Schulze, M., 53  
 Schwarz, H., 230  
 Seedorf, J., 170  
 Seelig, M. G., 272  
 Sehrt, E., 299  
 Seidl, F., 275  
 Serés, M., 232, 322  
 Shambaugh, G. E., 72  
 Shaw, C. G., 134  
 Shearer, J. S., 390  
 Sherren, J., 112  
 Sicilia, 50  
 Sieben, H., 148  
 Silk, G. F. W., 349  
 Silvestrini, L., 469  
 Simon, W. V., 26  
 Simpson, J. R., 76  
 Sinclair, J. F., 60  
 Singleton, A. O., 69  
 Skillern, R. H., 416, 417  
 Slesinger, E. G., 277  
 Sloan, H. G., 116  
 Smith, C. A., 2  
 Smith, J. M., 35  
 Smith, O. A., 155  
  
 Smith, R. R., 326  
 Smith, T., 39  
 Smithies, F., 274  
 Solurthwaite, H., 153  
 Solomons, B., 40  
 Sonnenschein, R., 416  
 Soresi, A. L., 16, 69  
 Soupault, R., 351  
 Speed, K., 457  
 Spence, R. C., 110  
 Spencer, F. R., 330  
 Spencer, H., 63  
 Spencer, H. R., 54, 141  
 Spencer, W. H., 360  
 Spiers, H. W., 378  
 Stanley, L. L., 4, 412  
 Steadman, F. S., 76  
 Stein, A., 371  
 Stephan, S., 474  
 Stern, M., 149  
 Stetten, D., 270  
 Stevens, A. R., 70  
 Stevens, R. H., 306  
 Stevens, T. G., 396  
 Stevenson, W. C., 307  
 Steward, F. J., 109  
 Stewart, M. J., 212  
 Stewart, W. H., 371  
 Stierlin, 263, 364  
 Stillians, A. W., 224  
 Stobie, H., 262  
 Stone, H. B., 369  
 Stookey, B., 207  
 Strachauer, A. C., 9  
 Strange, C. F., 28  
 Strangeways, T. S. P., 212  
 Straus, D. C., 120, 274  
 Struthers, J. W., 112  
 Stutzin, J. J., 485  
 Sullivan, J. J., Jr., 417  
 Summers, J. E., 452  
 Sutherland, R. W., 290  
 Swartz, E. O., 468  
 Sykes, E. M., 238  
 Symonds, C. P., 172  
  
 Taddei, D., 434  
 Tardo, G. V., 324, 487  
 Taylor, A. S., 194  
 Taylor, N. B., 257  
 Taylor, R. T., 434  
 Taylor, W. H., 257  
 Teale, F. H., 132, 302  
 Terry, W. I., 368  
 Thévenot, 123  
 Thomas, C. C., 448  
 Thomas, T. T., 285  
 Thompson, J. E., 383, 443  
 Thompson, L., 408  
 Thompson, R., 325  
 Thomson, S., 419  
 Tichy, 360  
 Tieck, G. J. E., 242  
 Tierney, J. L., 121  
 Tilley, H., 170  
 Timberlake, G., 411  
 Titus, P., 52  
 Todd, A. H., 27  
 Todd, H. C., 76  
 Todd, T. W., 18

- Torre y Blanco, J., 402  
 Toupet, R., 484  
 Towne, E. B., 173  
 Tranter, C. L., 382  
 Trotter, W., 277  
 Tuffier, 361  
 Turner, H. W., 332  
 Tweedy, E. H., 224  
 Tyler, A. F., 283  
  
 Underhill, F. P., 387  
 Unger, L. J., 268  
 Urrua, M., 6  
  
 Vail, H. H., 489  
 Vanderhoof, D., 381  
 Vayssiere, E., 402  
 Vernet, 173  
 Vernoni, G., 37  
 Vidal, J., 171  
  
 Villar, A., 403  
 Vilvandré, G. E., 40  
 Vital Aza, 54  
 Vogeler, K., 434  
  
 Wachs, C., 313  
 Wade, H., 325  
 Waldron, C. W., 175  
 Walker, J. W. T., 236  
 Wallis, R. L. M., 477  
 Wander, W. G., 33  
 Warren, R., 273, 457  
 Wassermann, S., 184  
 Watkins, J. G., 276  
 Watkins, W. W., 212  
 Weeks, J. E., 153, 238  
 Wehner, E., 348  
 Weise, H., 444  
 Weiss, S., 192  
 Welles, E. S., 231  
  
 Wells, J. R., 104  
 Wendel, A. V., 113  
 Wessler, H., 358  
 Weymeersch, A., 318  
 Wharton, L. R., 100  
 White, C. S., 24  
 White, F. W., 454  
 White, L. E., 242  
 Whitelocke, R. H. A., 189  
 Whiting, F., 328  
 Whitman, R. C., 128  
 Wiegman, E., 71  
 Wight, J. S., 169  
 Wilcox, D. G., 138  
 Wile, U. J., 281  
 Wilensky, A. O., 5  
 Williams, J. W., 481  
 Williamson, H., 63, 345  
 Williamson, R. T., 464  
  
 Willson, H. S., 186  
 Winans, W. W., 53  
 Wishard, W. N., 150  
 Wislocki, G. B., 303  
 Witherbee, W. D., 306, 392  
 Wood, W. Q., 453  
 Woolsey, G., 365  
 Wormser, E., 59  
 Wright, F., 222  
  
 Young, G., 414  
 Young, R. F., 266  
 Young, W. J., 134  
  
 Zadek, I., 463  
 Zarate, E., 479  
 Zeno, A., 31  
 Zerbino, V., 151, 456  
 Zueblin, E., 103



# INTERNATIONAL ABSTRACT OF SURGERY

JULY, 1920

## ABSTRACTS OF CURRENT LITERATURE GENERAL SURGERY—SURGICAL TECHNIQUE

### OPERATIVE SURGERY AND TECHNIQUE

Henderson, Y., Haggard, H., and Coburn, R. C.:  
**The Therapeutic Use of Carbon Dioxide after  
Anæsthesia and Operation.** *J. Am. M. Ass.*, 1920,  
lxxiv, 783.

In order to show the effects of inhalations of carbon dioxide it is essential to establish as a standard of comparison the usual behavior of patients following anæsthesia. This is difficult as after-effects vary according to the duration and depth of the anæsthesia, preliminary medication, the temperament of the patient, and the severity of the operation.

Protocols of the cases of one patient who received no carbon dioxide and of four who received inhalations after anæsthesia are given.

The authors conclude that inhalations of carbon dioxide properly diluted with air are highly beneficial, and if given carefully, a safe method of treatment after anæsthesia and operation. The beneficial effects observed were: (1) an augmentation of breathing which rapidly ventilates the anæsthetic out of the blood; (2) a powerful stimulant effect on the circulation, particularly the venous return, and rapid restoration of arterial pressure without subsequent relapse or unfavorable consequences; (3) a marked decrease of postoperative nausea, vomiting, and thirst; and possibly (4) restoration of intestinal tonus.

A simplified apparatus for the administration of carbon dioxide is illustrated and described.

ISABELLA HERB.

Landois, F.: **The Treatment of Postoperative Tetany in Man by the Transplantation of Parathyroid Glands** (Die Behandlung der postoperativen Tetanie durch Epithelkoerpertransplantation beim Menschen). *Zentralbl. f. Chir.*, 1920, xlvii, 74.

The author reports 35 experiments performed on dogs to discover the effect of transplanting parathyroids. Such transplantation may be done successfully only by the autoplasmic method and then

only within certain limitations. Autoplasmic transplantation prevented fatal tetany but did not save the animal from cachexia parathyreopriva. All the dogs in which homoplasmic transplantation was done died, either after the operation or following tetany. In the cases of dogs already suffering from tetany even autoplasmic transplantation was unsuccessful. A functional transplantation is successful therefore only in the absence of tetany.

Borchert reports cases in which he obtained more or less satisfactory results in man by means of homoplasmic transplantation after the onset of tetany. No absolute cure was obtained, however, as the author himself admits. Convulsions ceased, but the Chvostek, Trousseau, and Erb phenomena persisted. According to Landois, this fact proves that the transplanted parathyroids functioned only temporarily.

The transplanted glands soon become necrotic and are converted into a fibrous tissue mass. In a case of chronic postoperative tetany some parathyroid tissue must remain or the patient would succumb. If active gland tissue is implanted in such cases it functions immediately and the convulsions cease. This function lasts only until the transplant is replaced by fibrous tissue, but during this time the residue of the patient's own parathyroid tissue may recover or become hyperplastic and function sufficiently to prevent the recurrence of convulsions. The change in the clinical picture is then due solely to the parathyroid tissue the patient has retained and not to the homoplasmic transplant.

The transplantation of parathyroid tissue is of value only in the mild and chronic cases of tetany and never in the severe or acute cases in which all parathyroid tissue has been removed or destroyed at the time of the goiter operation.

The author has demonstrated that in about a week the transplanted tissue is completely necrotic. This was corroborated also by a clinical case in which the tetanic convulsions ceased for a period of nine days and then recurred and caused death.

According to our present knowledge the parathyroids are not organs of internal secretion but glands the function of which is to render harmless toxic substances within the body. It is obvious therefore that treatment with parathyroid extracts would be unsuccessful.

L. A. JUHNKE.

**Benjamin, A. E.: Postoperative Intra-Abdominal Adhesion—Some Causes and Means of Prevention.** *J. Lancet*, 1920, n.s. xl, 149.

In the author's opinion a most important factor in the causation of intra-abdominal adhesions is oral sepsis and unless all foci of infection are eliminated before operation a laparotomy in which an attempt is made to loosen adhesions of the abdominal viscera will result in failure.

In cases in which abdominal adhesions have formed, colitis and gastroptosis must not be neglected. When the bowel is crippled and fixed in a faulty position by firm bands an operation may be necessary to correct the condition. At operation raw surfaces should be thoroughly covered with unimportant contiguous structures, especially when local infection or intra-intestinal sepsis is present. All infected areas should be well drained and all tissue that will harbor infection indefinitely should be completely excised.

The operation must be performed quickly and with the least possible exposure of healthy tissue to infection. Care must be taken to avoid injuring the peritoneum by instruments, gauze, chemicals, or rough handling. The peritoneum must be closed in such a way that gaps or rents will be prevented. Intra-abdominal tension following a laparotomy should be reduced to the minimum.

P. M. CHASE.

### ASEPTIC AND ANTISEPTIC SURGERY

**Hawk, P. B., DaCosta, J. C., Smith, C. A., and others: A Chemical and Clinical Study of Chlorlyptus, A New Chlorinated Antiseptic.** *Therap. Gaz.*, 1920, n.s. xxxvi, 156.

Chlorlyptus is a synthesized chlorinated compound of oil of eucalyptus containing approximately 25 per cent of chlorine. It is a heavy, oily liquid of a dark red-brown color, acid in reaction, and having a slightly chlorinous aromatic odor. It is easily soluble in paraffin oil, alcohol, and ether, less readily soluble in chloroform, and but very slightly soluble in water. It may be used in the treatment of all conditions in which it is desirable to have a non-irritating antiseptic acting over an extended period of time.

Reports of several cases treated with chlorlyptus are given. When employed internally the drug is irritating to the stomach unless taken in double gelatin capsules the outer capsules of which are formol hardened. In the cases reported the administration was begun in 3-minim doses after meals. No toxic action was noted. The most disagreeable after-action was a slight regurgitation

which gave a taste of the drug in the mouth and was especially noticeable when the chlorlyptus was taken on an empty stomach. When the dose was increased up to 25 minims daily, the regurgitation and taste became more marked. The most definite effect was a very persistent urticaria lasting for three weeks, during which time nearly the entire body was involved.

Chlorlyptus in paraffin oil, 1:10, was used with benefit as a nasal spray. It caused a slight secretion of watery fluid, but never any evidence of inflammatory reaction. Local applications to the throat of chlorlyptus in oil, 1:5, were of evident benefit. In the majority of cases chlorlyptus appeared to act fully as readily and with less irritation than other chlorinated antiseptics. In addition, it seemed more suitable for use in the genito-urinary tract than other chlorinated antiseptics. It has been employed with good results also in the lower intestine. It has no corrosive action upon metals and therefore may be applied with the ordinary oil spray having metal parts.

I. W. BACH.

### ANÆSTHESIA

**Palermo, A. M.: Anæsthesia and Cerebral and Spinal Surgery.** *Med. Rec.*, 1920, xcvi, 231.

Palermo has abandoned the use of complicated automatic apparatus in his anæsthetic work and now uses a simple oxygen tank on the side of which is hung a bottle containing ether, the anæsthetic he uses constantly. By this means the oxygen becomes saturated with ether vapor and then is carried to the lungs through a tube running from the bottle to the mask. To date, 250 patients have been anæsthetized in this manner and there have been no deaths or complications which could be attributed to the anæsthesia. One hundred and fifty-eight of the operations were subtemporal decompressions; 12, suboccipital decompressions; 16, operations on the gasserian ganglion; and 14, laminectomies.

ISABELLA HERB.

**Fitz, R.: Surgical Anæsthetics in Diabetes Mellitus.** *Med. Clin. N. Am.*, 1920, iii, 1107.

In the five years preceding 1918, 365 diabetic patients were admitted to the Massachusetts General Hospital. Fourteen per cent required surgical treatment. Of the 54 with surgical complications, 9 were obviously unsuited for operation either because of their general condition or because the surgical condition present did not warrant operative interference. Forty-five patients came to operation. In this series there were 13 deaths, a mortality of nearly 30 per cent.

The author divides these cases into two groups, the first group consisting of 20 cases in which there was an acute infection or gangrene before operation, and the second consisting of 25 non-infected cases. Since 10 of the infected patients died (50 per cent) and there were 3 deaths among those not infected (12 per cent), it is evident that any acutely infectious



condition in a diabetic patient requiring surgical interference must be considered at once of the utmost gravity, and a non-infectious condition requiring operation is also dangerous.

Local anaesthesia was used in 12 cases, spinal anaesthesia in 8, gas-oxygen anaesthesia in 11 and ether anaesthesia in 14. In the fatal cases of infection local anaesthesia was induced in 3; spinal anaesthesia in 5; gas-oxygen anaesthesia in 4; and ether anaesthesia in 1. At least as regards the infected cases there seems no reason for assuming that one anaesthetic was more harmful than another. In the non-infected cases, on the other hand, no deaths followed local or gas-oxygen anaesthesia, while 1 patient died after spinal anaesthesia and 2 after ether anaesthesia.

The majority of the infected patients were surgical emergencies and could not be given a thorough course of pre-operative treatment. Four, however, were thoroughly prepared for operation by a prolonged course of treatment and of these 2 died, both patients under 30 years of age. Two other patients who died were aglycosuric just before operation. The remaining 14 patients were operated upon soon after they entered the hospital. Six died, a mortality of 43 per cent. The importance of pre-operative preparation in a septic case is therefore an open question. The prolonged undernourishment necessary to free the urine of sugar and acid and to render normal the blood-sugar, fat, and acetone-body concentration may so lower the patient's resistance to infection as to be unjustifiable. The best rule would seem to be to postpone operation as long as the patient's clinical condition permits, but not until septicæmia has developed or the patient has become so weak that his powers of recuperation and resistance are lost.

Nine of the 25 uninfected patients were given prolonged medical treatment and none of them died although 4 were given ether anaesthesia, and 2, spinal anaesthesia. Two were made aglycosuric just before operation, but did not receive prolonged treatment. One died following ether anaesthesia and 1 lived following spinal anaesthesia. Fourteen were admitted to surgical wards at once and operated upon without consideration of the diabetes. Two died, 1 after ether anaesthesia and 1 after spinal anaesthesia. Six others were given ether; 1, spinal anaesthesia; 1, gas-oxygen, and 4, local anaesthesia.

From this statistical survey Fitz draws the following conclusions:

It is evident that no diabetic is as good a surgical risk as a normal person. No diabetic with an acutely infectious process is as good a surgical risk as a diabetic without signs of infection. Whenever possible a prolonged course of pre-operative treatment should be given to minimize the dangers of operation. The risk of any operation for a properly prepared non-infected diabetic patient is slight, but local anaesthesia or gas-oxygen are safer anaesthetics than spinal anaesthesia or ether. A diabetic with an infectious process requiring operative interference

must be regarded as critically ill. A course of treatment for the diabetes should be undertaken in preparation for operation when possible and insisted upon in all uninfected cases in which the surgical complication is not an acute emergency. ISABELLA HERB.

#### Gwathmey, J. T.: *The Anaesthetic Problem in Lung Surgery.* *Rhode Island M. J.*, 1920, iii, 41.

Gwathmey's paper is based upon a large clinical experience and between 80 and 100 experiments performed upon animals in the central Medical Department Laboratories, A.E.F., Dijon, France.

The anaesthetic agent used in lung surgery should be one that sustains the blood at the highest level consistent with good surgical anaesthesia during the operation and with a minimum of reaction afterward. By a process of elimination it was found that the choice lay between ether and nitrous oxide. The final choice was nitrous oxide and oxygen.

As a method of administering the anaesthetic, the positive-pressure method was selected. This involved the use of an air-tight mask with a rubber-bag reservoir for the gases and a pressure of from 5 to 10 mm. of mercury. An expiratory valve may be provided for the escape of the gases but is not absolutely essential as the mask may be held in such a manner as to allow a constant leakage. No air can possibly enter the apparatus at any time when positive pressure is sustained. A slight positive pressure in addition to the gases is unquestionably an important factor in maintaining anaesthesia and a great aid to the surgeon as it facilitates the examination of the lung, makes the operation easier, eliminates the necessity for dangerous traction, gives satisfactory hæmostasis, and obviates the need for haste.

The apparatus for administering nitrous oxide and oxygen is so simple and inexpensive that it may be used universally not only for lung surgery but for other operations as well.

It was found that full surgical anaesthesia which is safe without preliminary medication is unsafe following preliminary medication. For this reason the deep anaesthesia was gradually merged to a light anaesthesia, and finally to analgesia with unconsciousness. In the earlier work it occasionally happened that when too much oxygen was given, all physiological requirements were met and breathing ceased temporarily for a half or three-quarters of a minute. During this interval the pulse continued as before and the patient had a pink color. Such a temporary cessation of breathing may be obviated by: (1) decreasing the positive pressure momentarily, (2) allowing air to enter the mask, or (3) slightly increasing the amount of nitrous oxide.

ISABELLA HERB.

#### Mott, C. H.: *Intratracheal Insufflation of Chloroform: A Report of 357 Cases.* *Proc. Roy. Soc. Med.*, Lond., 1920, xiii, Sect. Anæs., 25.

In recent years there has been a tendency to improve the methods of inducing anaesthesia with ether.

The drop and the vapor methods are seldom followed by serious after-effects, and the introduction of intratracheal insufflation of ether has rendered the use of chloroform even less necessary. Today chloroform is used largely as a mere adjunct to ether.

Ether is given with success by either the closed or the open methods; chloroform, by only the open method. The more open the method, the safer the use of chloroform.

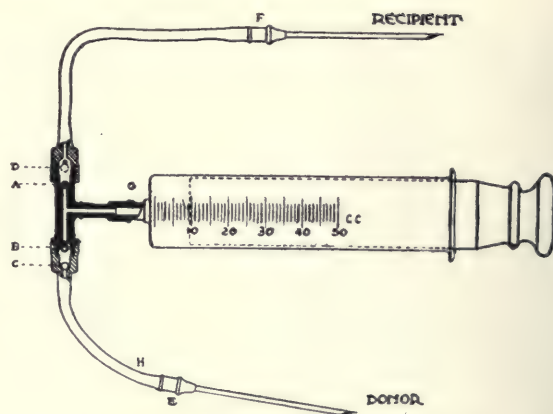
The author discusses chloroform intratracheal anaesthesia and gives a description of the apparatus which he devised and employs. ISABELLA HERB.

### SURGICAL INSTRUMENTS AND APPARATUS

**Stanley, L. L.: Blood Transfusion Apparatus.** *J. Am. M. Ass.*, 1920, lxxiv, 671.

The apparatus described is of the ball-valve type and can be used with a Luer syringe of any capacity. When the plunger of the syringe is drawn out, Ball A engages in the socket, preventing the passage of fluid, while Ball C is displaced upward to Position B, allowing the blood to come from the donor into the syringe. When the syringe piston is pushed in, the ball in the lower chamber engages the socket at C, preventing the fluid from returning to the donor. At the same time Ball A is released from its socket and assumes a position in the upper chamber at D, allowing the blood forced from the syringe to flow into the veins of the recipient. The balls engage by gravity and the valve must be held in vertical position. The arm of the recipient, therefore, must be slightly higher than that of the donor. The syringe and attachments are sterilized and the interior of the syringe is coated with Ablemann's citrated ointment consisting of:

	Gm. or Ccm.
Adeps lanæ .....	10.00
Aqua.....	10.00
Sodium Citrate.....	10.00
Petrolatum q. s. ad. ....	100.00



Air is first displaced by drawing in sodium chloride solution, a few cubic centimeters of which are left in the barrel. The blood is then drawn in the usual manner. If it is desired to give citrate solution with the blood, a burette is provided to which a rubber tube is attached with a No. 28 hypodermic needle at its end. The needle is plunged into the connecting tube at H. As the blood is being drawn from the donor the citrate solution is taken in from the container. The percentage of the mixture is regulated by the size of the needle used at H and E and the strength of the citrate solution.

The advantages claimed for the method are: (1) the amount of blood transfused can be measured; (2) the blood is not exposed to the air; (3) the method is direct; (4) only veins are used and repeated transfusions from the same donor may be made; and (5) any amount of blood can be transfused quickly.

This same apparatus may be used for injections of arsphenamine solution, the fluid being drawn from the vessel through the donor's tube and injected through the recipient's tube. I. W. BACH.

## SURGERY OF THE HEAD AND NECK

### HEAD

**Clift, M. W.: Fluoroscopic Examination in Injuries to the Head.** *Am. J. Roentgenol.*, 1920, n.s. vii, 137.

The author does not urge the substitution of fluoroscopy for the ordinary procedure of stereoscopic plating, but is firmly convinced that preliminary fluoroscopy will generally facilitate the diagnosis and increase its accuracy. The enormous experience of the war has demonstrated the value of the fluoroscopic examination in revealing the presence not only of intracranial foreign bodies but also of small fractures, empyemata of the sinuses, and minute foreign bodies in the orbit.

To insure a thorough examination and avoid missing important pathology Clift advocates a

routine method of procedure. The patient should be placed first in dorsal decubitus, when the head should be examined postero-anteriorly, being rotated toward the right until the lateral position is reached, then back again, and then rotated toward the left and back again to its original position. To examine the sinuses, the head should be flexed on the neck. The patient should then be placed in the prone position with the head placed in Water's position. To examine the jaw, the patient should be placed in the supine position and the head slowly raised until the outline of one ramus is unobstructed. In searching for foreign bodies in the orbit, the head should be turned so that the injured eye is nearest the screen, and then rotated until a silhouette of the lids is obtained.



To determine the presence of foreign bodies in the head close co-operation between the roentgenologist and surgeon is necessary and the methods of procedure must be adapted to the surgical requirements. To fix the track of the foreign body the central ray should be directed through it and the point of entrance. To determine the depth, the author prefers the Roussel method. To solve the problem of the relationship between a foreign body and important anatomical structures he employs a cross-section anatomy with a key plate on celluloid used directly on the fluoroscopic screen. The article includes also descriptions of various devices and procedures which will facilitate the removal of foreign bodies.

ADOLPH HARTUNG.

**Wilensky, A. O.: The Association of Fever with Fracture of the Skull.** *Am. J. M. Sc.*, 1920, clix, 402.

A slight rise of temperature is so common after fracture of the skull, with and without injury of the intracranial contents, that it is rather expected in almost every case. This rise is rarely above 100 degrees F., lasts for approximately twenty-four hours, and then subsides. In some cases, however, fever assumes a more important rôle, rising to extraordinary heights and persisting for comparatively long periods of time. Such fever indicates the presence of a grave complication or the reaction to an extensive trauma. The author has made a study of cases in this latter group.

Definite fever occurred in 15 of a series of 72 cases of fracture of the skull. In another series of 77 cases, it developed in 22. In the febrile cases of the first series the fractures were situated in the posterior fossa in 6, in the middle fossa in 2, and over the vertex and sides of the skull in 7. One fracture was compound externally, 1 communicated with the middle ear, and 2 communicated with the nasal cavities. The others were closed fractures. Eight of the patients who developed fever died. In 4 cases the cause of death was meningitis.

In a number of the febrile cases the temperature was of a moderate degree and the cause of it could not be established. In 1 case it continued for two days. Except that it persisted somewhat longer than usual, it approximated the initial reaction that is seen frequently and would not have attracted attention if the author had not been making a special study of this type of case.

In one fatal case an excessive degree of fever was associated with an extensive cranial fracture and widespread disorganization of the intracranial contents. In 2 other fatal cases the probabilities were very strong that there was considerable intracranial hæmorrhage, but in neither was there any indication of an infectious process or any complicating condition which would account for the irregular temperature.

In 1 case fever was associated with a compound fracture. The scalp wound had been sutured immediately and apparently had healed by primary

intention. As no other cause for the fever was found, the author believed that an infection was present in the wound and was successfully combatted by the natural powers of the body.

An interesting case cited was that of a child of 6 years who sustained a fracture in the posterior fossa of the skull. Nothing extraordinary was noted at the time of the patient's admission to the hospital, and there were no signs of disturbed neurological function. Fever of a slight degree was present from the beginning and by the fifth day it had risen to 102.4 degrees F. During routine examination a laceration was discovered in one drum-head, and as it had been stated positively in the history that there had been no preceding affection of the ear, it seemed logical to suppose that the fracture had opened into the middle ear and had become infected secondarily. The otitis subsided very quickly and in ten days after the injury the perforation in the drum-head had closed completely. On the thirteenth day the temperature reached 104 degrees F. Lumbar puncture was done and repeated two days later. Except for some increase of pressure on the first tapping the procedure yielded negative results.

During the second week the following neurological signs developed rather slowly and irregularly: (1) a weakness of one facial nerve; (2) a convergent squint; (3) a slight twitching of the left upper extremity; (4) a very slight retraction of the head with moderate rigidity of the neck which could be forcibly overcome; (5) a tendency to a Kernig on the right side; and (6) irritability. No abnormality was discovered in the chest or abdomen and no focus of infection was demonstrated in the limbs. In the third week the temperature gradually subsided to normal, the signs and symptoms gradually disappeared, and a perfect recovery resulted.

The question in this case was whether the child had had a basilar meningitis from which it had recovered, or whether the fever was due to some other cause. The probabilities of a meningitis were much strengthened by the fact that the child was admitted to the hospital a short time after the termination of the influenza epidemic. At the same time that this patient was in the hospital another child was admitted to the same ward who presented a similar clinical picture. In the second case death resulted and an autopsy revealed a basilar meningitis with a shaggy, greenish exudate in the smears of which organisms resembling the influenza bacillus were demonstrated.

Fever occurred also in 2 cases as a reflection of some complicating condition. The most important was meningitis.

In some of the cases operated upon fever was present both before and after operation and in others only after operation. When excessive fever developed after operation there was never any conclusive proof that it was due directly to the operative intervention, and in all probability the nature of the injury and the resultant pathologic changes contributed largely, if not entirely, to the pyrexia.



In 1 case fever occurred after lumbar puncture. A child sustained a fracture in the parietal region. On admission the patient was drowsy, but otherwise exhibited no definite symptoms of a focal lesion. Twenty-four hours later there were indefinite signs referred to the lower extremities; the power of the left seemed to be impaired and the right was somewhat spastic. Lumbar puncture was done and bloody fluid released from the spinal canal. Up to this time the temperature had been normal, but immediately thereafter it began to rise and in twenty-four hours it reached 101.4 degrees F. Operation done at this time demonstrated extradural bleeding over an intact dura and was followed shortly by death.

From a study of these cases the author concludes that fever associated with injury of the skull is much more common than a perusal of the literature would lead us to suppose. In the obscure cases the mechanism for the appearance of the fever is believed to involve disturbances of the heat-regulating centers.

In the consideration of the mechanism of fracture of the skull with intracranial injury attention is attracted to the fact that when a communication is established by dural laceration with the subarachnoid space cerebrospinal fluid must be released into the adjacent tissues. This is analogous to the release of cerebrospinal fluid by lumbar puncture, and it is therefore not unreasonable to assume further that in the presence of some hidden or dormant focus of infection in the body, either nearby or at a distance, fever would follow. This assumption offers a very satisfactory explanation of the sudden and sharp rises of temperature sometimes observed following decompression or other cranial operations in which the dura is opened and cerebrospinal fluid is released from the subarachnoid space.

In the author's opinion the fever may be accounted for by any one of the factors mentioned in this paper.

G. W. HOCHREIN.

**Urrua, M.: Investigations Regarding the Earliest Degenerative Changes in Traumatic Lesions of the Cerebrum** (Algunas investigaciones de los fenomenos mas precoces en la degeneración traumatica del cerebro). *Med. Ibera.*, 1920, x, 65.

By means of a special technique the author has been able to observe certain very early microscopic changes following experimental traumatic lesions of the cerebrum of adult chickens. Cerebral punctures are made by means of very fine scalpels and the chickens killed at intervals of one, two, or three hours. Pieces of tissue are fixed in formalin, washed in water, and left in an alcohol-ether mixture for ten minutes. They are then warmed in a 1 per cent solution of potassium ferrocyanide and washed and warmed in a 2 per cent silver nitrate solution to which a few drops of gum arabic or protargol solution have been added. The sections change to a coffee or sepia color. They are next placed in a hypsulphite solution and then in water. After



Changes in axones of cerebrum one and one-half hours after trauma.

dehydration in alcohol they are cleared in creosote and mounted.

On microscopic study of sections prepared in this way three distinct zones are seen: first, the zone next to the lesion which consists of coagulated blood, fibrin, torn axones, and nerve fibers; second, the intermediate and most interesting zone, in which the earliest degenerative changes are found; and last, a zone of normal tissue. The following degenerative changes are seen in the intermediate zone:

Changes in the neurones themselves are not marked because of the shortness of the time elapsing before the fowls were killed. Incipient degenerative changes consist of the condensation of cords of neurofibrillæ and the early appearance of vacuoles. The cells next to the lesion first lose the fine texture of the neurofibrillæ.

The first change in the proximal ends of severed axones is the appearance of a clubbed extremity called the "sphere of retraction" ("a" in illustration). When the sphere of retraction is quite large,



fusiform enlargements occur along the whole course of the axone and give it a beaded appearance ("b" in illustration). Other axones become more delicate and terminate in a fine ring at the severed end ("d" in illustration). Retraction spheres next develop hyaline zones resembling vacuoles. Still later, delicate fibrillæ representing attempted regeneration bud out. In the absence of the sheath of Schwann, however, these regeneration tendrils soon atrophy for lack of guiding and nutritive substances. Later the retraction spheres lose their regenerative buds, become hyalinized, and disappear.

W. R. MEEKER.

**Oppenheimer, S.: Some Remarks on Sinus Thrombosis in Children.** *Arch. Pediat.*, 1920, xxxvii, 65.

The greatest problem of sinus thrombosis in children is its early diagnosis. This is nearly always difficult and often impossible.

There are two recognized forms of thrombosis, primary or marasmic, and secondary or infective. The former is found almost invariably in the longitudinal sinus, rarely in the lateral sinus, and still more rarely in the cavernous sinus. It occurs in the extremes of life, and exhausting disease, such as diarrhoea in infants, is often the basic condition. The diagnosis is seldom made before death.

Infective thrombosis is the more frequent and follows the extension of an inflammation from parts contiguous to the sinus wall. It occurs in the sinus nearest the seat of the primary lesion, which most often is in the middle ear. The pathology of this type of sinus thrombosis and the variations in child and adult anatomy which influence the disease are discussed in full.

Fever of a very septic type is the most important general symptom of sinus thrombosis, and a two-hour record should be taken in order to note the variations accurately. Older children may have headache. In some cases there may be a unilateral enlargement of the lymph nodes at the juncture of the facial and internal jugular veins. This and postmastoidal oedema are valuable signs. Enlargement of the retropharyngeal lymph glands may cause a dysphagia. In some cases optic neuritis is present.

A positive blood culture is absolute evidence that the organisms have entered the circulation and an indication for immediate operation.

The prognosis depends upon the duration of the condition before operation.

The article is concluded with a brief description of the operations for sinus thrombosis.

K. L. VEHE.

**Broders, A. C.: Squamous-Cell Epithelioma of the Lip: A Study of 537 Cases.** *J. Am. M. Ass.*, 1920, lxxiv, 656.

The author gives a very complete analysis of 537 cases of squamous-cell epithelioma of the lip. The series represents 26.85 per cent of 2,000 cases of general epithelioma.

The disease is found in the proportion of 49 to 1 in males and females respectively, and at an average age of 57.3 years. As a class, farmers are most often affected. Family history and injury are negligible factors. The duration of the lesion prior to operation showed a wide variation, the shortest being 0.08 years and the longest 28 years. The average was 2.58 years. The size of the lesions also varied greatly. The growth was situated on the lower lip in more than 95 per cent of the cases and in a slight majority was on the left side. It was rarely found at the angles of the mouth.

Smoking, especially pipe smoking, seemed to bear a definite relation to the disease, although approximately one-fifth of the patients did not use tobacco. This proportion of users and non-users held among 500 patients without epithelioma whose average age, however, was nineteen years less than that of the patients with epithelioma of the lip. The results after operation in the cases of tobacco users were not quite so good as among the non-users. Thirty per cent of the patients with inoperable growths did not use tobacco.

It is of interest to note that cases not treated with caustics and by measures other than surgery gave better postoperative results and fewer metastases than those which had received such treatment. Metastasis was found in 19.48 per cent of the untreated cases and in 31.91 per cent of those treated prior to operation.

The growths removed were examined with regard to the degree of cell differentiation and the number of mitotic figures present, and on the basis of these data were placed in four grades. This gave a working basis on which to judge the degree of malignancy. The percentages of cases in the four grades were, respectively: Grade 1, 15.82 per cent; Grade 2, 62.01 per cent; Grade 3, 21.04 per cent; and Grade 4, 1.11 per cent.

The tumors of Grade 1 were of the smallest average size. None of these patients died from epithelioma of the lip. The majority of the epitheliomata were found to have been preceded by ulcer or a sore of some kind. This was especially notable in the tumors of Grade 2. Tumors of Grade 4 had no preceding history of ulcer. All patients with tumors of this grade died from epithelioma and none of those who were operated upon was without metastasis.

Of the patients operated on for epithelioma of the lip at the Mayo Clinic and traced, 40.52 per cent are dead. When lymph nodes were removed metastasis was demonstrated in 23.38 per cent; the submaxillary nodes were involved in 87.61 per cent of these. Tumors which produced metastasis were usually larger in size and of longer duration than those which did not.

Of the patients with metastasis, 82.6 per cent are dead. Of those without metastasis, 76.26 per cent are living and 92.71 per cent of these report a good result. Of the patients who had metastases only those who had involvement of the submaxillary nodes on one side reported a good result. No patient



with involvement of the cervical glands or of more than one group of glands survived. Of the patients who died with metastases, 91.6 per cent died from epithelioma.

The author estimates that a patient with only unilateral involvement of the submaxillary lymph nodes has a 1 to 3 chance of obtaining a good result and a life expectancy of 6.18 years after operation. Some other malignant neoplasm was associated with the epithelioma of the lip in 0.93 per cent of the cases.

J. W. ROSS.

**De la Presa y Vazquez, J. L.: The Treatment of War Fractures of the Mandible** (Tratamiento de las fracturas de guerra del maxilar inferior). *Rev. españ. de cirug.*, 1919, i, 723.

From an extensive review of the literature and many of his own cases in the recent war the author draws the following conclusions:

The fracture fragments should be immobilized early and preferably by means of the d'Angle apparatus. This apparatus is especially valuable for complicated cases in which there are two or more fractures. It consists essentially of two bands of thin metal and a screw fitted with a nut. A band is adjusted around a firm tooth and held firmly by screwing on the nut. Several bands may be applied or a single large band to include several teeth may be used with silver wire at the interdental spaces to secure alignment.

The mouth should be carefully washed and hæmostasis and drainage of the buccal cavity maintained at all times. Further surgical procedure should be delayed until the resistance of the region is increased by means of liquid diet and other general measures. No attempt should be made to suture the integument or any of the soft parts as such measures predispose to infection and sphacelus even when the suturing is done a week after the injury.

Fractures of the horizontal rami are distinguished by their mobility and a tendency to pseudarthrosis. Those of the ascending ramus are characterized by immobility and a tendency to trismus. The latter usually heal spontaneously, effective apposition being maintained by the masseter and pterygoid muscles. Pads and bandages are not sufficient to assure absolute immobilization and should be used only in conjunction with more efficient methods of obtaining internal support. Osteosuture should not be done when the loss of bony substance exceeds 2 cm. It is better to immobilize the fragments and re-establish the continuity of the mandible at the expense of interdental apposition with bone transplants. Osteoperiosteal transplants used according to Delagenière's method are the most satisfactory. While cartilaginous transplants used according to Moresli's method would probably give better cosmetic results, they are more difficult to apply and result in less bone regeneration.

Pseudarthroses may be corrected either by surgical intervention at the focus with subsequent im-

mobilization by means of an osteoperiosteal graft or the application of the Vilaine type of braces and wires. The majority of cases of trismus are myopathic in origin and should be treated by continued forced extension. When the lesion is osteo-articular in origin resection of the condyle with the interposition of fascia is indicated.

W. R. MEEKER.

**Ivy, R. H.: The Operative Treatment of Ununited Fractures of the Mandible.** *Ann. Surg.*, 1920, lxxi, 363.

Ivy reports 22 cases of non-union following gunshot fracture of the mandible which he observed at the Walter Reed Hospital. These cases came to operation after the lapse of periods ranging from six to seventeen months following the original injury.

In 21 there was free mobility between the fragments, and in 1, firm fibrous union in a very bad position which was complicated by a large loss of substance.

Of the 22 cases operated upon, the body was involved in 11, the symphysis in 3, the symphysis and the body in 2, the angle in 3, the angle and ramus in 1, and the ramus in 2.

The object of treatment in such cases is restoration of the function of mastication. This was obtained by restoring occlusion of the teeth and filling in the lost bone.

For restoring the lost bone substance three types of grafts were used: (1) a pedicled bone graft obtained from the mandible itself; (2) an osteoperiosteal graft from the tibia; and (3) a graft from the crest of the ilium.

Of a total of 25 operations, 19 (76 per cent) were successful. In 4 of the failures complete regeneration did not occur, and in 2, there was suppuration.

M. N. FEDERSPIEL.

## NECK

**Bouman, H. A. H.: The Early Diagnosis of the Malignant Thyroid—Especially Carcinoma.** *Minnesota Med.*, 1920, iii, 105.

The general signs of malignant goiter, cardiovascular disturbances, tremor, exophthalmos, and rapid loss of flesh, vary according to the functional change in the gland.

Latent thyrocarcinosis, like latent cancer of the stomach, is seldom diagnosed. The most frequent symptom is a continuous loss of strength associated with a normal appetite and digestion. Careful questioning usually elicits the fact that the goiter has slightly increased in size as evidenced by an uncomfortable pulling and drawing in the thyroid region. Pain, however, is absent. The loss of flesh is gradual. Ultimately neuralgic pain develops and there is some difficulty in respiration with light attacks of a smothering sensation when the recumbent position is assumed. At this stage it is still possible for the patient to take a fair degree of



exercise without stopping to recover his breath and, except for the loss of flesh and strength, he does not regard himself as ill. The most careful search usually fails to disclose the cause of the general symptoms.

Less frequently, but sufficiently often to attract attention, disturbances of the heart, such as palpitations and arrhythmia, occur. The heart beats are usually regular, but suddenly two or three precipitated beats come in intermittent fashion. Symptoms simulating angina pectoris are observed. Fever is absent, but there may be peculiar disturbances of the nervous system with vertigo, temporary loss of vision, and disturbed mentality. In all cases lesions of the peripheral nerves are manifested by neuralgic pains which are variable in degree, character, and location. There are occipital pains, lumbago, pain resembling that of acute pneumonia, and bilateral neuralgia of the neck and shoulders radiating from the thyroid.

At a more advanced stage cachexia becomes established. Properly, this is only a more marked degree of loss of flesh and weight. Pallor is marked

and the mucous membranes are pale. The complexion is subicteric, but the eyes do not become yellow. Hæmorrhage is not noted except through generalizations established in vital organs such as the lungs or kidneys. Edema of the extremities is an invariable and early symptom. Some patients suffer dysphagia and experience great thirst. There is no leucocytosis and local symptoms are often masked by the general manifestations. In most of the cases observed, however, a swelling of the gland had become apparent in less than eighteen months but the most important fact was the increasing hardness of one or more nodes embedded in the softer parenchyma of the gland.

In the absence of a goiter the disease may manifest itself somewhat differently. In the thyroid region a small tumor appears which at first grows quite slowly, but later more quickly. In the beginning the only significant factors are the patient's age, the growth of the tumor, pain, and a light dyspnoea, but these are sufficient for a diagnosis if the frequency of cancer and the rarity of goiters in the old are borne in mind.

E. C. ROBITSHEK.

## SURGERY OF THE CHEST

### CHEST WALL AND BREAST

**Strachauer, A. C.: A New Operation for Pyothorax: The Trephine Operation.** *Minnesota Med.*, 1920, iii, 127.

The trephine operation for pyothorax was first performed six years ago. A short incision is made over and parallel to the rib at the site selected for drainage. The rib is trephined, the posterior periosteum and parietal pleura are incised crucially through the bone hole, and a stiff, very snugly fitting rubber drainage tube the same size as the trephine is inserted to make an air-tight joint. The tube must not impinge upon the lung. It is brought through a small opening in a square of dental rubber dam the edges of which are fastened to the skin with adhesive tape. A few turns of adhesive tape are put around the tube to hold it in position. A negative-pressure and irrigation apparatus is then attached to the drainage tube.

The operation has the following important advantages:

1. Trephining a rib is much more simple than resection.
2. Multilation, deformity, and spur formation with fixation to the adjoining ribs are avoided.
3. Continuous and even negative pressure may be maintained and in this way pneumothorax and its attendant evils may be prevented.
4. The negative pressure aids in the expansion of the compressed lung and the obliteration of the cavity.
5. The function of all the non-consolidated portions of the lung is conserved.

6. All discharges are collected in the receiving bottle, which obviates the necessity for repeated dressings and increases the patient's comfort and cleanliness.

7. The suction prevents the accumulation and retention of pus in the pleural sac and the absorption of the toxins.

8. The chance of introducing secondary infections is less than in open drainage.

9. Provision is made for the germicidal and solvent action of Carrel-Dakin irrigation.

10. When the infection has subsided and the pleural sac has become sterilized, a functioning lung capable of filling the thoracic cavity has been preserved.

C. R. STEINKE.

**Manson, F. M.: The Treatment of Empyema by a Closed Method.** *Minnesota Med.*, 1920, iii, 124.

This article is based on 177 cases of empyema treated at Camp Dodge. Various methods were tried. In 65 cases treated by early rib resection the mortality was 54 per cent, while in those treated by repeated aspiration and deferred thoracotomy it fell to 32 per cent. Forty-three cases were treated by repeated aspiration and the injection of a 2 per cent solution of formalin-glycerin. Not one patient was cured by aspiration alone. Following a simple intercostal thoracotomy and the insertion of a  $\frac{5}{8}$ -in. rubber tube with a negative pressure attachment 4 of 29 patients recovered. Nineteen were treated later by the Mazingo technique. This technique was as follows:

Under novocaine anaesthesia a small incision was made in the skin over the cavity as determined by

preliminary aspiration and a 7 mm. trocar with cannula was introduced into the pleural cavity. The trocar was then withdrawn, the cannula being left in place until after the introduction of a No. 24 French catheter with one terminal and two lateral openings. The pus was then withdrawn with a 30-ccm. Luer syringe, care being taken to prevent the entrance of air by clamping the tube before disconnecting the syringe. After the pus had been withdrawn, from 20 to 50 ccm. of Dakin's solution were injected into the cavity and sucked in and out to dissolve the fibrinous mass. The cavity was then nearly filled with Dakin's solution which was allowed to remain from ten to thirty minutes.

The treatment described was repeated from four to six times in twenty-four hours, depending on the patient's condition and the rapidity with which the pus accumulated. The tube was kept clamped except during aspiration and injection. All cases were controlled by laboratory count. When smears of the discharge were free from micro-organisms—usually in from ten to fourteen days—the period between treatments was extended to twelve hours and after each irrigation from 10 to 50 ccm. of a 2 per cent solution of formalin-glycerin were injected and left until the next treatment. The process was then repeated. As soon as the discharge became sterile to culture and the cavity had diminished to a capacity of from 15 to 20 ccm. the tube was withdrawn and the opening allowed to heal.

Of the 43 patients treated by this method all were cured of empyema and only 1 required a secondary operation. The average time between operation and the closing of the wound was thirty-one days. The shortest time was sixteen days. Thirty-seven of the patients had been subjected to repeated aspirations previously or had been treated by some form of thoracotomy. The mortality was 4 per cent. Manson believes that if only the closed method had been used even better results might have been expected.

Among the advantages of the operation described are absence of pain, tenderness, and the formation of scars, and the fact that it permits the attainment of full chest expansion. C. R. STEINKE.

**Riesman, D.: Pleural Effusion with Inversion of the Diaphragm Producing an Abdominal Tumor: Together with Remarks on Acute Pulmonary Oedema following Tapping.** *Am. J. M. Sc.*, 1920, clix, 353.

The author reports an interesting case in which pleural effusion was so extensive that the diaphragm on the affected side became inverted, forming a sac within the abdomen.

The patient, a woman of 77 who for years had had diabetes and chronic nephritis, was suddenly taken with acute indigestion. This was followed by marked dyspnoea, cyanosis, and a marked increase in the pulse rate.

On examination a large, tense, rounded mass was felt in the left upper quadrant of the abdomen.

The entire left chest was flat and the apex beat was found just inside the right nipple line.

The removal of 5 pints of fluid from the chest by tapping caused the disappearance of the abdominal tumor. Following the tapping pulmonary oedema developed, but yielded to hypodermic injections of morphine and atropine and dry cupping.

The patient completely recovered and at the present time is well.

The article is concluded with a brief review of the literature. P. M. CHASE.

**Perthes, G.: The End-Results of the Treatment of Cancer of the Breast Before and After the Introduction of Prophylactic X-Ray Treatment following Operation** (Erfolge der Brustkrebsbehandlung vor und nach Einfuehrung der prophylaktischen Roentgenbestrahlung der operierten Faelle). *Zentralbl. f. Chir.*, 1920, xlvii, 125.

Group 1 of the cases reviewed comprised 130 cases which were operated upon between 1910 and 1912 and were not treated with the X-ray. Recurrence developed in 27 per cent within the first year and in 47.5 per cent within three years. In 4 cases the recurrence did not develop until the sixth year, a fact which demonstrates that the five-year limit arbitrarily adopted for the study of the results of treatment in such cases is not sufficient to exclude the possibility of recurrence.

Groups 2 and 3 comprised 144 cases insufficiently treated with the X-ray. Recurrence developed in 38.2 per cent within the first year and in 54 per cent within the first three years. Only 20.3 per cent were free from recurrence after the five-year limit.

Group 4 comprised cases treated with intensive X-ray dosage during the years 1917 and 1918. Of 72 cases in which the operation was performed at least one year ago 41 per cent showed recurrences within the first year. In 18 per cent, however, the recurrence took place outside of the operative and X-ray field.

The conclusions drawn are that the prophylactic treatment of cancer of the breast after operation has not improved the results to date and that to obtain such improvement more powerful and intensive raying is necessary. L. A. JUHNKE.

#### TRACHEA AND LUNGS

**McCrae, T.: The Physical Signs of Foreign Bodies in the Bronchi.** *Am. J. M. Sc.*, 1920, clix, 313.

Unrecognized cases of foreign bodies in the bronchus are by no means rare. In numerous instances the presence of a foreign body is unsuspected for months and even years. In some acute cases a diagnosis of pneumonia is made and in other instances a chronic condition has developed which is diagnosed as tuberculosis or bronchiectasis.

The physical signs due to a foreign body in a bronchus are very diverse and may change in a short interval of time because of a change in the position of the foreign body. It is not uncommon to find



signs over both lungs and in some cases they are more diffuse on the unaffected side.

The only sign the author has noted in every case is decreased expansion of the affected side.

What is described as the "asthmatoïd wheeze," heard by holding the bell of the stethoscope before the patient's mouth, is present in a considerable number of cases, as are also fine "tissue-paper râles." Certain foreign bodies, especially the peanut, may cause acute and dangerous changes, "arachidic bronchitis."

The presence of a foreign body should be taken into consideration in every case of pulmonary abscess and bronchiectasis and in all cases in which there are signs in a lower lobe for which there is no evident explanation.

S. S. HOWE.

**Heuer, G. J., and Dunn, G. R.: Experimental Pneumectomy.** *Bull. Johns Hopkins Hosp.*, 1920, xxxi, 31.

In the course of experiments relating to thoracic surgery carried on with many interruptions during the past six years by Cave, Holman, and the authors, they have had occasion to remove entire lungs from 23 dogs. It seemed to them of interest to assemble the results and study them from various viewpoints: (1) to discover the effects of total pneumectomy upon the pulse, blood pressure, and respiration; (2) to determine the results obtained in the treatment of the bronchial stump by various methods; (3) to observe the reaction on the part of the pleura upon the pneumectomized side—meaning by reaction the development or the absence of a pleural effusion; (4) to follow the fate of the intrapleural cavity resulting after removal of the lung and the methods obliterating it; (5) to observe the reaction on the part of the remaining lung—by reaction meaning the development or absence of a simple enlargement associated with dilatation of the alveoli analogous to emphysema; a hypertrophy; or a hyperplasia; and (6) to estimate the probable duration of life in animals after a total pneumectomy.

These various aspects of the subject are of predominant importance in lobectomy in man and although they have been the subject of previous experimental work, agreement in the results has so far been lacking.

The technique employed was very uniformly as follows:

1. Intratracheal anæsthesia was induced with a positive-pressure apparatus.

2. In view of the infectious complications following previous experimental work, the skin was cleaned with the greatest care. After it was shaved and washed with soap and water, it was washed with alcohol and dried; then washed with pure carbolic acid and again with alcohol. If the original scrubbing of the skin was not so vigorous as to cause multiple bleeding points, the skin did not suffer from this vigorous treatment and rarely showed even the slightest dermatitis.

3. An intercostal incision was made upon the left side, preferably in the fourth or fifth interspace. The chest was opened widely and the wound held apart with a rib spreader. The lung was drawn into the wound, the pulmonary arteries and veins at the hilus were individually isolated, doubly ligated with silk, and divided. The main bronchus or its main branches were isolated and stripped of all lung tissue. The bronchi were then divided and the lung removed. The divided bronchi were closed by various methods. Before closure a culture was usually made from the mucous membrane just below the bifurcation of the trachea in order to determine the bacterial flora in the upper air passages. The closed bronchial stump was dropped back into the pleural cavity without any attempt to cover it with a fold of the pleura or pericardium. The wound was closed in layers with silk without drainage, the two ribs adjacent to the incision being brought together with encircling sutures. The skin incision was covered with a simple collodion dressing. Before closure of the thoracic wall, the remaining lung was distended to its normal capacity.

Of 23 dogs on which total pneumectomy was done 13 recovered and 10 died. The fatalities occurred in from four days to two months after operation. Six of the deaths were due to an epidemic of distemper which swept through the kennels during the earlier period of the experimental work. The autopsy examinations in this group did not show a single case of infection of the parietal wound or pleura or any leakage from the bronchial stump. One animal died of a simple pneumonia unassociated with other evidences of distemper. At autopsy there was no infection of the parietal wound or pleura and no leakage from the bronchia l stump. One animal died two months after operation, apparently from starvation. At autopsy a remarkable degree of emaciation was noted but no other cause to which the death might be assigned. There was no infection of the parietal wound or pleura and no leakage from the bronchial stump. Two animals died of acute pneumothorax, the result of leakage from the bronchial stump. In one of these the failure to secure adequate closure of the bronchial stump was intentional. In the other a necrosis of the bronchial wall followed the application of an intentionally flattened (not rolled) metal band.

It seemed to the authors of interest also to determine whether or not total lung excision seriously affects the future life of animals subjected to this operation. A number of the dogs so treated were therefore kept under observation for a year and exposed to the same vicissitudes of existence as other animals. So far as could be determined they were active, healthy, and free from dyspnœa, and they held their own with the other animals. Only one animal apparently suffered as a result of the removal of the lung. This dog avoided the others, was not so eager at feeding time as they, and had periodic attacks of dyspnœa. With this exception, it seemed evident that the excision of one lung did

not affect the activity of the animals or the duration of their lives.

One of the animals became pregnant several months after the operation and gave birth to a litter of seven healthy pups. This dog is still living.

G. E. BEILBY.

### PHARYNX AND ŒSOPHAGUS

**Bullrich, R. A.: A Causative Factor of Cancer of the Œsophagus** (Un factor determinante del cancer del esofago). *Semana méd.*, 1919, xxvii, 15.

Cancer of the œsophagus is very common in the Argentine Republic. In a review of the literature the author found that the great majority of the patients came from the interior of the Republic. "Mate" is a national drink in the Argentine and used extensively in the interior of the country. To make it the water is brought to the boiling point and then poured over the herb. The drink is taken immediately while it is still very hot. Any one who is not used to it burns his hands on the dish, burns his lips on the tube through which he drinks it, and burns his tongue and œsophagus at the first swallow. The peasants, who are accustomed to the mixture, are amused at its effect on those who take it for the first time but they do not know that this repeated trauma may be the point of

origin for the fatal dysphagia which is so common among them.

Since 1914 Bullrich has kept a record of his cases. Sixteen of his patients were males and three females. Their ages were as follows: between 30 and 40, one; between 40 and 50, eight; between 50 and 60, seven; between 60 and 70, two; and between 70 and 80, one. By nationality 13 of them were Argentinians; 2, Russians; 2, Spaniards; 1, an Italian, and 1, a Paraguayan. Therefore 13 were natives and 6 were foreigners. All but one of them came from the interior of the country. Thirteen were farmers, one was a mason, one a carpenter, one a cook, two were without work, and one was a servant. All of them had drunk mate for years.

In seventeen of the cases the cancer was situated in the upper third of the œsophagus, and in two, in the lower third. This may be explained by the fact that the upper third is more exposed to the traumatism from the hot water than the middle and lower thirds.

Bullrich mentions also two cases of dysphagia in patients who were not mate drinkers. One of these patients had a hysterical œsophagism and recovered spontaneously. The other died and the autopsy showed the œsophagus to be involved and compressed by a group of fibrocancerous glands.

M. M. MATTHIES.

## SURGERY OF THE ABDOMEN

### ABDOMINAL WALL AND PERITONEUM

**Cosens, W. B.: The Cause and Treatment of Abdominal Hernia.** *Practitioner*, 1920, civ, 220.

During the last five years the author has been in medical charge of a camp of German prisoners of war and has kept notes regarding the condition of the 27,635 men examined. He believes that the explanation given by many of these prisoners that they had to perform manual labor to which they were unaccustomed truthfully explains the causation of their herniæ. Congenital and acute herniæ are due to incompetent muscular action and intra-abdominal pressure. Lack of resistance is due to: (1) anatomical deficiency; (2) loss of nerve power from disease or senile change; (3) deficiency of muscular control caused by lack of physiological use or by nerve disability.

Preventive treatment consists of keeping the abdominal muscles in a state of efficiency by daily drill in keeping the rectus and oblique muscles in a slight degree of tension. Especially in children deep breathing exercises are invaluable.

The application of trusses is too frequently done crudely. Cosens describes what he considers the correct method.

In the operative treatment it should be borne in mind that in many of these cases the muscles are inefficient and unable to act as a permanent block

to the descent of the intestine. True resistance may be obtained by producing adherence of fascia to fascia.

E. C. ROBITSHEK.

**Northrop, H. L.: The Radical Cure of Femoral Herniæ by the Inguinal Route.** *Hahneman Month.*, 1920, lv, 187.

In order to bring about a radical cure of a femoral hernia, Poupart's ligament must be approximated or attached to the underlying horizontal ramus of the pubic bone, i.e., the pectineal fascia covering it. This latter structure, however, is far from sufficiently substantial to fix Poupart's ligament securely and permanently to the underlying pectineal fascia, particularly if there is pressure of the abdominal viscera above and behind tending to separate these structures still further and precipitate a recurrence of the hernia. The author has endeavored to overcome this difficulty by employing the inguinal route in the treatment of femoral hernia.

By the inguinal route two substantial fibrous structures are approximated and secured under the guidance of the eye, namely, Poupart's ligament and Cooper's ligament. The following technique is employed:

1. An incision is made through the skin and fascia, exactly as in an operation for an inguinal hernia.



2. The aponeurosis of the external oblique is divided in the direction of its fibers.

3. The upper flap of the external oblique aponeurosis having been raised, the conjoined internal oblique and transversalis are brought into view. A retractor is then slipped under these muscles and used to retract them upward. Another retractor is passed under the lower flap of the external oblique aponeurosis, which is drawn downward, bringing Poupart's ligament into full view. The round ligament of the spermatic cord is retracted upward. Good retraction exposes the transversalis fascia. This is nicked, divided bluntly along the line of the original incision, and then picked up with retractors exactly like the other structures. The peritoneum and neck of the sac are also brought into view. The deep epigastric artery is usually encountered during this stage and may be drawn aside or, if it runs an anomalous course, divided between ligatures.

4. The peritoneum having been opened, the hernial contents are pulled up out of the sac, replaced in the peritoneal cavity, and if necessary, held there with a gauze pack. If the intestine or omentum is strangulated, it may be liberated with ease by cutting Gimbernat's ligament. If the contents are adherent, the sac may not be adherent to the tissues of the thigh (almost always the case) or it may adhere to its bed. In the first instance traction on the hernial contents pulls the entire sac out of its bed, converting the femoral hernia into an inguinal hernia. In the second instance the incision should be extended downward on the thigh, over the protrusion, and the sac dissected free from its adhesions.

5. A dressing forceps is introduced into the sac, closed, and withdrawn upward. This everts the sac and converts a femoral hernia into an inguinal hernia. The sac is tied off with a ligature or suture. If the sac does not evert easily it is adherent and must be dissected from its bed by retracting the lower skin flap or incising downward.

6. The femoral ring is closed. The ring is exposed by retracting the lower flap of the external oblique downward and outward and retracting the skin, the upper flap of the external oblique, the tendon of the internal oblique and transversalis muscles, and the transversalis fascia upward and inward. When the parts are retracted the horizontal ramus of the pubic bone can be palpated and it can be seen covered by a dense, tough, white, glistening fascial band. This is Cooper's ligament. With a small, full-curved needle a kangaroo or chromic catgut suture is passed through Cooper's ligament deep enough to go down to the periosteum of the pubic bone and just inside of the iliac vein and then through the lower flap of the transversalis fascia and the edge of Poupart's ligament. Another suture is similarly placed internally to the first, and if necessary a third. The innermost suture always picks up Gimbernat's ligament. When these sutures are tied they approximate Poupart's ligament to Cooper's ligament and effectually close the hernial orifice.

7. The seventh step is the ordinary closure of an inguinal hernia.

The author has operated on 8 cases of femoral hernia by the inguinal route and believes it to be an ideal method. In none of his cases was he obliged to add the fourth step. In 2 cases there was strangulation requiring resection and anastomosis. This step, so difficult to perform when the old "femoral incision" is employed, was easily and successfully done by way of the inguinal route.

G. W. HOCHREIN.

**Eisendrath, D. M.: The Inguinal Route in Femoral Herniotomy.** *Surg. Clin. Chicago*, 1920, iv., 49.

The sac of a femoral hernia protrudes from the transversalis fascia and parietal peritoneum close to the inner aspect of the femoral ring. After entering the ring itself and the femoral canal, the sac and its contents are in close relation to Cooper's ligament and the pubic bone behind, Poupart's ligament in front, the femoral vein on the outer side, and Gimbernat's ligament on the inner or mesial side. The sac then descends beneath Poupart's ligament in the space known as the femoral canal on the inner or mesial side of the femoral vein and comes to the surface through the saphenous opening.

The details of femoral herniotomy by the inguinal route are given as follows:

1. The inguinal canal is opened as for the repair of an inguinal hernia. The author prefers to carry the incision dividing the external oblique aponeurosis through the internal pillar of the external ring as this makes it possible to cover the cord more completely in the last step of the imbrication method of Andrews. The canal and the spermatic cord having been opened, the inner half of the external oblique and the internal oblique are held inward, the outer half of the external oblique and skin flap are held outward and the sac of the femoral hernia is separated from the fat and other tissues of Scarpa's triangle. To facilitate the dissection it may be necessary to make a vertical incision downward from the original incision and over the femoral swelling. The sac having been freed as high as possible, it is opened and its contents are examined.

2. The contents of the sac are reduced through an incision which, if necessary, may be carried clear to the neck of the sac. Such high exposure affords better access to the point of strangulation and gives more space for an intestinal resection than the older methods.

3. The adherent omentum is freed from the neck of the sac, the empty sac is pulled upward through the femoral ring, a high ligation of the sac is done, and the distal portion is removed.

4. The external iliac vein is now retracted outward and the inner aspect of the femoral ring exposed. This is obliterated by three chromic catgut sutures, two of which are passed through Cooper's and Poupart's ligaments and the third through Cooper's and Gimbernat's ligaments.



5. The inguinal canal is closed by the Bassini method or the Andrews imbrication method and the skin is closed in the usual way. I. W. BACH.

**Cates, B. B.:** A Further Note on an Operation for the Radical Cure of Femoral Hernia. *Am. J. Surg.*, 1920, xxxiv, 90.

More than ten years ago in an emergency operation for strangulated femoral hernia with gangrene of the ileum in the sac the author cut through Poupart's ligament in order to liberate the gangrenous bowel and secure ample working space for its resection. He closed the opening in the peritoneum and sewed Poupart's ligament to the pubic portion of the fascia lata. The patient, a man, has remained well and without recurrence for more than ten years. Since this first case the author has had occasion to use the same technique in 2 cases of strangulated femoral hernia in women. The technique was as follows:

A long incision was made in the skin from the spine of the pubis outward, below and parallel with Poupart's ligament. Two pairs of Mayo forceps were thrust into the femoral ring above the neck of the sac for a short distance and the falciform and Poupart ligaments divided for  $\frac{1}{2}$  in. Other forceps were then pushed in above the first pair and the tissues divided with the scissors. The wounding of important structures was avoided by sponging back the tissues and dividing between forceps. When anomalous obturator or deep epigastric arteries were divided they were held securely between the forceps and tied when most convenient. After the ligaments were divided the sacs were opened and the bowels replaced. After the contents of the sac had been replaced the peritoneum was pushed back with gauze for 1 in. or more above Poupart's ligament. The sac bore the same relation to the general peritoneum as the neck of a gourd to the body of a gourd. The narrowest part of the sac was tied with a double strand of No. 2 catgut on a Mayo needle and the redundant portion cut away. The remaining part was gathered on the catgut suture and, by thrusting the needle through the entire thickness of the abdominal walls, was sewed to the anterior surface of the abdomen as in the MacEwen operation for inguinal hernia. This last step of the operation was done entirely outside the peritoneal cavity. The operation was completed by sewing the inner end of Poupart's ligament to the pubic portion of the fascia lata with catgut and closing the skin incision with silkworm-gut sutures without drainage.

G. W. HOCHREIN.

**Dutrey, J.:** The Mechanism of the Peritoneal Absorption of Certain Solids (Mecanisme de la absorción peritoneal de partículas solidas). *Semana méd.*, 1920, xxvii, 249.

To study the mechanism of peritoneal absorption, Dutrey injected different amounts of India ink into the peritoneal cavities of guinea pigs. In guinea pigs killed twenty-four hours after an injection

of 1 ccm. of ink most of the granules were found in the omentum and diaphragm. When larger doses were injected a considerable amount was found in the omentum and diaphragm, the abdominal, paravertebral, mesenteric, and pelvic glands. The parabronchial lymph glands were also pigmented and the posterior side of the sternum showed the pigment in fine black lines.

When smaller amounts were given the omentum was loaded with the pigment and the diaphragm contained smaller amounts. The peritoneal surfaces were normal in appearance but the paravertebral glands, especially those situated behind the kidney, were pigmented. Very faint black lines were observed on the posterior surface of the sternum, but the pigment was not found constantly in the hilus glands of the lungs.

When doses of  $\frac{1}{10}$  ccm. of the India ink were injected, the greater portion of the pigment was again found in the diaphragm, but none of it could be discovered anywhere else except in the lymph glands behind the kidneys.

Whatever the size of the dose, the liver, spleen, kidneys, lungs, and other viscera showed no microscopic alteration whatever. In the mechanism of the absorption the leucocytes were thought to play the major rôle. Immediately following an injection into the peritoneal cavity an exudation occurred which diluted the ink. A microscopic study of the exudate showed that in the first few hours there were very few leucocytes, but these increased in number until, at the end of twenty-four hours, the ink granules had all been taken up. Under the microscope the cytoplasm of the leucocytes was found to be filled entirely with ink granules so that the nucleus could not be seen.

Dutrey's conclusions are as follows:

The lymphatic system and other closely related structures such as the omentum and diaphragm seemed the chief agents in the absorption of injected solids. The blood and vascular systems appeared to take no part in this absorption, particles of the India ink never having been found in the blood stream. A study of various organs such as the liver, spleen, and kidney revealed very few leucocytes filled with ink granules, a fact, which demonstrates that there are no direct avenues of absorption between the peritoneal cavity and these viscera. It is logical to assume that an injected substance is retained to a certain extent in the lymphatic system but that a portion eventually reaches the circulatory system by way of the thoracic duct, being thus distributed to various organs of the body. W. R. MEEKER.

#### GASTRO-INTESTINAL TRACT

**Novak, E.:** Polypoid Adenoma of the Stomach; Removal by Gastrotomy. *J. Am. M. Ass.*, 1920, lxxiv, 871.

Three types of gastric adenoma are found: (1) polypoid adenoma either single or multiple; (2) the polyadenoma *en nappe* of Menetrier which is



characterized by the involvement of large areas of stomach wall; and (3) the adenoma of the Brunner-gland type.

Little is known of the etiology of the condition although gastric catarrh is considered to be a predisposing cause. It is generally conceded that these growths have a strong tendency to become malignant.

Polypoid adenomata of the stomach occur in the advanced years of life and seldom cause any distinctive symptoms. The usual picture is that of chronic gastritis with severe epigastric pain.

The tumor is generally discovered during operation for some unrelated condition and is removed by incision into the stomach.

In the case reported by the author the growth was found during an operation for cholecystitis and removed by gastrotomy. The patient made an uneventful recovery.

P. M. CHASE.

**Coffey, R. C.: Gastro-Enterostomy Still the Treatment for Chronic Gastric and Duodenal Ulcers.** *Ann. Surg.*, 1920, lxxi, 303.

The author presents the results of his operations for gastric and duodenal ulcers during the past fifteen years.

From 1904 to 1919 he operated upon 233 cases of gastroduodenal ulcer. There were 10 deaths, a mortality of 4.33 per cent. Other statistics show a mortality varying from 2.38 to 8.3 per cent. The causes of death in the author's 10 cases are given and the cases briefly discussed.

There were 9 instances of secondary or recurring ulcer. Of these, only 2 developed after a simple posterior gastro-enterostomy.

In 3 cases a late severe hæmorrhage developed: in 1, following simple gastro-enterostomy, and in 2, following the Eiselsberg procedure.

Carcinoma developed in only 4 cases of the entire series, in 3 instances following excisions.

The author's technique for gastro-enterostomy is described in full. The use of clamps and linen sutures perforating the bowel or stomach is avoided. As suture material Coffey prefers tannin catgut. One of the most important steps in the operation is the suturing of the mesentery borders to the stomach and intestines. This should be done so that no tension or torsion in either structure results.

In conclusion the author states that whatever the situation of the ulcer, it is best to do a gastro-enterostomy and await results. A radical operation may then be done if trouble develops. The mortality following excision after a gastro-enterostomy is practically nil, regardless of the procedure used.

P. M. CHASE.

**Leotta, N.: Simple Ulcer of the Jejunum and Ileum** (*L'ulcera semplice della porzione digiuno-ileale dell'intestino tenue*). *Arch. ital. de chir.*, 1919, i, 349.

Simple ulcer, known also as chronic ulcer, round ulcer, and trophic ulcer, was first described as a

distinct morbid entity by Cruveilhier in 1830. It occurs commonly in the stomach and duodenum and less frequently in the lower end of the œsophagus, the large intestine and, following gastro-enterostomy, the loop of the jejunum, areas which come under the action of the gastric juice. In 8,060 autopsies Donati found gastric ulcers in 2.6 per cent but not a single case of simple ulcer of the jejunum or ileum.

Leotta has collected 21 authentic cases of ulcer of the jejunum and ileum from the literature and to these he adds one case of his own. The author's patient was a man 25 years of age who had always been in good health and who, following a dietary indiscretion, was suddenly seized with severe abdominal pain of a diffuse type associated with vomiting, diarrhœa, and slight fever. These symptoms continued for two days. At the end of that time he was brought to the hospital with all the symptoms and signs of diffuse peritonitis. At operation free gas and a seropurulent exudate were found in the abdominal cavity and a perforation of the ileum about 20 ccm. from the cæcum. The ulcer was clean cut and sharply punched out. There was practically no infiltration of the margins and no tendency to the formation of adhesions. No other lesions were demonstrable. Excision of the ulcer and closure of the bowel were followed by recovery. The Widal reaction on two occasions was negative. Microscopic examination of a portion of the excised ulcer showed it to have the characteristics of a simple ulcer of the stomach with no surrounding infiltration.

In most of the cases reported in the literature the ulcer was discovered after the patient had died from peritonitis due to perforation. In 3 cases it was found at operation which was followed by recovery. Peritonitis due to perforation was present in all of the cases.

Pathologically the type of ulcer described is single, round, clean cut, and punched out. It has narrow margins and is seldom surrounded by callous induration or infiltration. It must be differentiated pathologically and clinically from typhoid ulcers, the acute ulcer of gastro-enteritis, tuberculous, syphilitic, and neoplastic ulcers, and ulcers due to foreign bodies, infected emboli, uræmia, and nerve lesions. The etiology is not known and the symptoms are vague. The diagnosis made is usually peritonitis. This peritonitis simulates the peritonitis following typhoid perforation but is not associated with the picture of asthenia observed in the latter.

I. F. VOLINI.

**Coffey, R. C.: A Permanent Colostomy or Enterostomy Which May Be Closed by an Extra-peritoneal Operation.** *Ann. Surg.*, 1920, lxxi, 299.

The loop of gut is drawn through a rectus incision and the mesenteric borders of the two limbs are sutured together, space being left at the apex. Care is taken to suture the mesentery back of this

line to prevent a knuckle of gut from being incarcerated in the space. After the loop is sutured to the peritoneum, the muscles and the aponeurosis, a flap of skin  $\frac{1}{2}$  in. wide by 2 in. long is dissected up, thrust through the space at the apex, and sutured to the opposite skin edge. The wound is then closed. To avoid tension on the skin flap a rubber tube is passed over it under the bowel.

When it becomes desirable to close the colostomy, the septum, including the skin flap, is destroyed with pressure camps and the faecal fistula thus formed is closed extraperitoneally.

P. M. CHASE.

**Soresi, A. L.: Technique of Appendectomy.** *Ann. Surg.*, 1920, lxxi, 315.

The author proposes a technique for appendectomy in all acute cases which makes the operation safe, rapid, and easy of performance and gives very satisfactory after-results.

The method is based on the following principles:

1. Never look for the tip of the appendix, which is difficult or impossible to find, but search only and in all cases for its base, which can be found very easily, safely and quickly.

2. Keep away from the peritoneal cavity.

3. Do not use protective pads. Work always in the open, seeing exactly what you do and how you do it, and knowing that it is done as you want it to be done.

A pararectus incision from 8 to 10 cm. in length is made. The peritoneum is freed from any adhesions only on the external side, the inner edge being left untouched. The outer side of the cæcum is liberated and raised and the base of the appendix is located. The appendix is freed and a purse-string suture thrown around it. The appendix is divided between clamps, the stump inverted, and the purse-string suture tied. The remainder of the appendix is then removed, great care being taken not to break up adhesions. If the tip remains, no harm is done provided there is free drainage.

In the matter of drainage, paraffined-gauze strips are recommended as better than other material. The drains are inserted through stab wounds in the flank, or the vagina in the female, and never through the laparotomy wound. Thus they will come from the most dependent part of the cavity. Where they pass through the abdominal wall they are enclosed in a short paraffined rubber tube. The drains should not be changed frequently.

When necessary, the abdominal wall is drained by paraffined threads, one set just above the peritoneum, the other just above the aponeurosis and muscle layer. These are brought out through a stab wound just below the incision and enclosed in a rubber tube.

The skin wound is closed with elastic bands attached to adhesive straps.

Interval cases without adhesions are handled as formerly, the appendix being removed entire.

The stump is not ligated as bleeding is prevented by penetrating the mucosa of the cæcum

with the purse-string suture, a true inversion of the stump rather than a mere depression being thus effected.

The wound is dressed with an elastic belt constricting the entire abdomen.

P. M. CHASE.

**Rulison, E. T.: The Clinical Application of the Carrel-Dakin Method to Cases of Acute Appendicitis Requiring Drainage.** *Surg., Gynec. & Obst.*, 1920, xxx, 294.

In an attempt to shorten the period of drainage following acute suppurative appendicitis Rulison has been studying the technique and effect of applying Dakin's fluid to the drainage tract. As severe pain and shock attend the introduction of Dakin's fluid into the free peritoneal cavity, it is necessary to establish a straight, walled-off tract before the fluid is introduced. The injections will then be intra-abdominal but not intraperitoneal. Mechanical pressure, either by tubes or fluid, upon the walls of the tract must be avoided.

A detailed account of a somewhat elaborate technique is given and an analysis of the results in a series of cases. The author warns against an indiscriminate use of the method.

L. H. TUHOLSKE.

**Cope, Z.: The Surgical Aspects of Dysentery.** *Lancet*, 1920, cxcviii, 579.

Dysentery may appear as a complication of a surgical condition, as a flaring-up of a previous condition incidental to an operation, or as a fresh infection on an already weakened resistance. The surgical complications of dysentery, however, are not common. Dysentery at times may simulate surgical conditions such as cancer of the rectum. Piles also are frequently misleading when associated with dysentery.

Amœbic typhlitis may resemble appendicitis, and amœbic hepatitis, cholecystitis. Amœbic dysentery, due to the entamœba histolytica, leads to ulceration of the intestinal wall which in severe cases resembles wet blotting paper. In the bacillary type the etiological organisms are the bacilli of Shiga and Flexner and the Y-bacillus. In this type fever and toxæmia predominate and ulceration is not a constant factor.

The surgical complications of dysentery may be divided into three groups: (1) those due to local processes in the intestine, (2) those following the remote effect of the organism or its toxins, and (3) associated surgical conditions. In Group 1 the author places:

1. Perforation of the colon causing general peritonitis, pericolicitis, or pericolic abscess. This condition is more common than would be expected and found more often in the amœbic than in the bacillary infections. The symptoms produced depend on the position and direction of the perforation of the ulcer. The condition of the patient is usually very poor and the sewing of the friable bowel wall entails many technical difficulties.



2. Acute oedematous localized colitis, especially typhlitis. In this condition it is found that cæcal dysentery is often latent and misleading, so that a wrong diagnosis of acute appendicitis is made. Relief is frequently afforded by the administration of emetine.

3. Dysenteric appendicitis. This may be associated with dysenteric typhlitis and seldom occurs alone.

4. Extensive sloughing of the mucous membrane. In some patients the colon becomes an actual pus sac. Frequently it is difficult or actually impossible to isolate the specific bacilli as there is usually an associated secondary infection the organism of which overshadows those of the primary infection. In the treatment of patients with extensive colonic ulceration of amœbic origin an appendicectomy, cæcostomy, or some similar operation which will provide rest and permit irrigation of the affected bowel is advised.

5. Cicatrization and stricture of the colon or rectum. These conditions were found surprisingly seldom.

6. Perinephritic abscess. This complication cannot be definitely attributed to dysentery, but should not be totally disregarded.

The amœba histolytica may be the etiological factor in several associated conditions. The most common of these is amœbic hepatitis which is readily amenable to treatment with emetine. Another associated condition is liver abscess of amœbic origin. This is now preventable by the early treatment of dysentery with emetine. When once formed, however, such abscesses should be drained and the amœbæ in their walls destroyed. Similar abscesses are found occasionally, though rarely, in the kidney, brain, and spleen.

Group 2 includes the remote complications of surgical interest such as septicæmia, arthritis, iritis, pyæmia, myalgia, fibrositis, and periostitis which are found in bacillary dysentery. The associated conditions which fall in Group 3 are parotitis, boils and abscesses, and thrombosis. G. S. FOULDS.

**Reeder, J. D.: Stricture of the Rectum.** *Am. J. Surg.*, 1920, xxxiv, 49.

There are three types of rectal stricture, the annular, the tubular, and the linear. The annular stricture assumes the shape of a ring which involves only a very small portion of the rectum and completely surrounds it. The tubular stricture is a tube-like constriction an inch or more in length which involves the entire circumference of the bowel. The linear stricture consists of a cicatricial or fibrous deposit over a limited area of the circumference of the intestine by which the caliber of the bowel is lessened either by the mass of the deposit itself or by contractions of the walls of the gut over the area it occupies.

According to their etiology rectal strictures may be divided into congenital, traumatic, tuberculous, neoplastic, syphilitic, gonorrhœal, dysenteric, and inflammatory strictures.

Small cicatricial or connective-tissue deposits in the intestinal walls are constant sources of irritation because of the friction produced by the passage of fecal matter over them. Similar symptoms may be produced by obstruction due to external pressure such as that of tumors. In such cases an inflammation may be set up in the intestinal walls which will eventually produce stricture.

Under the term "spasmodic stricture" two dissimilar conditions have been described. In one, a contraction with no organic change in the gut causes spasmodic contraction of the muscles without any actual shortening; in the other, organic change and permanent constriction of the tube are produced by persistent spasmodic contractions and result in shortening and fibrous transformation of the muscular fibers involved.

Strictures may occur at any point in the intestine from the margin of the anus to the upper limits of the pelvic colon, but the large majority begin within the first 6 cm. of the anus. It is necessary to determine not only the presence of a stricture, but also its location, pathologic character, its extent, and its degree. When the stricture is low down these facts may be learned with comparative ease. The history of the case will give valuable information as to the presence of the stricture and its pathologic character. Previous injury or operation, diffuse proctitis, pelvic cellulitis, prolonged labor, perirectal or pelvirectal abscess, syphilis, fistula, or rectal ulceration may give clues.

Examination should be made with the patient on his side, the hips being flexed upon the abdomen and elevated upon pillows. The character and odor of a discharge from the parts should be carefully noted. The best way to arrive at a diagnosis is to insert the finger.

In the treatment gradual dilatation has succeeded in curing a certain number of strictures as it squeezes the blood out of the strictured area and when the instrument is withdrawn a state of arterial hyperæmia follows which results in the absorption of the newly formed tissues. If the stricture is ulcerated or infected, it should be treated locally through the proctoscope before an operation or dilatation is attempted. The best local agents are a 10 per cent solution of ichthyol in glycerin, a 3 to 5 per cent solution of silver nitrate, and a 10 per cent solution of tincture of iodine in glycerin. After the condition clears up gradual dilatation should be begun with Wale's bougies, not more than three sizes being used at a treatment and the treatments being given at intervals of two or three days.

The patient should be given a nourishing but non-irritating and preferably a nitrogenous diet and with it a large amount of cod-liver oil or olive oil. Purgatives are absolutely contra-indicated.

The chief local and operative treatments are dilatation or divulsion, proctotomy, excision and entero-anastomosis, colostomy, and electrolysis. Tuttle's method of introducing bougies is used.

I. W. BACH.

**Todd, T. W.: Anatomical Considerations in the Rectal Prolapse of Infants.** *Ann. Surg.*, 1920, lxxi, 163.

Attention is directed to the type of prolapse of the rectum which begins at the anal margin. In view of the occurrence of this condition in infants and young children, the results of investigations on the infant pelvis are recorded.

A sagittal section of the pelvis at birth shows that the rectum at that time is in a position of mechanical disadvantage as it occupies a lower site than the bladder and uterus and the sacrum is less curved than the sacrum of the adult and therefore not as able to relieve it from the pressure of overlying viscera.

The rectal stalks comprise the tissue surrounding the middle hæmorrhoidal vessels and visceral pelvic nerves, branches of which pass to the rectum from the third and fourth sacral trunks. In the adult the possible increase in length of the rectal stalk corresponds roughly to the distance the rectum can be drawn out of a perineal wound when the levatores ani, but not the stalks, have been completely severed. In the infant the length of the rectal stalks and their increase in length on dissection correspond proportionally to the conditions found in the adult. There is therefore no greater laxity of the rectosacral attachments in the infant than in the adult.

From the facts enumerated it is evident that the only anatomical factors of special importance in the rectal prolapse of infants are the comparatively straight sacrum and the more vertical rectum.

E. H. POOL.

**Hirschman, L. J.: A Successful Hæmorrhoid Operation under Local Anæsthesia.** *Am. J. Surg.*, 1920, xxxiv, 58.

After the skin surface has been prepared by the alcohol-iodine method, a point  $\frac{1}{2}$  in. behind the posterior commissure of the anus is pinched or touched with a swab moistened with phenol. The syringe needle is inserted at this point and the solution distributed in a U- or V-shaped direction around the posterior third of the anal circumference so as to produce pressure on the sphincter nerves.

The subcutaneous infiltration is continued until the anus has been completely surrounded and the surrounding skin is then grasped at four points with a Pennington triangular forceps. The hæmorrhoids having been everted by traction, a 0.5 per cent solution of apothesine or quinine and urea hydrochloride of the same strength is injected into them. The most dependent hæmorrhoid is grasped with the forceps, drawn down in its long axis, and held with a No. 2 catgut suture passed through it at its juncture with the healthy mucous membrane and tied. The anterior hæmorrhoids are ligated in the same manner, then the posterior and the upper in the order named. After ligation the hæmorrhoids are excised from without inward, as much of the normal mucosa being saved as possible.

I. W. BACH.

**Beer, E.: Aseptic Amputation of the Rectum.** *Am. J. Surg.*, 1920, xxxiv, 53.

The great advantage in the technique described is the rapid healing of the large wound made by the excision of the rectum and lower sigmoid.

The intestines having been thoroughly cleansed by two courses of castor oil, the anal opening is shut off by suture. A skin flap is then turned up around the anal circumference and sewed together with a heavy silk suture so as to prevent leakage. The area is then painted with iodine.

The rectum is exposed by an incision running well up above the peri-anal denudation and a little to the left of the median line. The coccyx is removed in the usual way and the rectum liberated well above the growth. The pouch of Douglas is opened and the sigmoid drawn down so that it is liberated well above the growth and glandular involvement. The peritoneum is closed at the new level on the sigmoid.

The skin incision is then continued down to the denuded area on either side of the anus. After the anus is liberated from its attachments, the rectum, sigmoid, and anus, unopened, are thrown over on the sacrolumbar region. The levator ani muscles are united to make a firm pelvic floor and a tube is placed in the most dependent part of the wound, the original site of the anus. Skin stitches are inserted and a small packing is introduced up to the suture line at the pouch of Douglas.

The protruding gut is tied off about  $\frac{1}{2}$  in. from the level of the closed skin and a clamp is placed across the bowel about 1 in. distal to the ligature. The intestine is sutured to the skin without entering its lumen, and a small packing inserted above the new position of the gut. The wound is then dressed while the gut is still attached. After the dressing is applied, section of the bowel is done with the cautery between the ligature and the clamp.

The ligature is allowed to remain in place until the patient complains of distention or cramp-like pain. It is then opened and a rectal tube is introduced well into the bowel. The rectal tube is held in place by a purse-string suture.

I. W. BACH.

**Kiger, W. H.: Tuberculous Fistula in Ano.** *Am. J. Surg.*, 1920, xxxiv, 40.

The tuberculous variety of fistula in ano is characterized by a pale surface, reduction of adipose tissue, cold, a "boggy" feeling, and absence of abscess formation. There is no pus although the sanious discharge is often mistaken for pus. The ordinary form of fistula in ano results from an inflammation characterized by pain, heat, swelling, redness, and abscess formation calling for the immediate evacuation of pus.

The treatment of tuberculous fistula in ano is operative. The patient's physical condition, the technique of operation, and the anæsthetic are all of the utmost importance. For general anæsthesia chloroform is the anæsthetic of choice as it causes the least irritation to the lungs and kidneys. Local



anæsthetics are of less value as the area infiltrated is not sufficient to render the operation painless, the skin is too thin for injection, and the needle puncture forms a route by which the disease may be spread.

The author's method of treating tuberculous fistula in ano is summarized as follows:

1. Thorough flushing of the bowels both the evening and morning before operation.
2. The use of spinal anæsthesia which is easily induced, effects complete relaxation, and does not cause nausea, vomiting, or shock.
3. Thorough opening of all sinuses and cavities and the trimming of the overhanging edges by means of the Percy cautery knife.
4. Cauterization of the exposed injected area and all fistulous tracts.

Any fistulous opening into the bowel which passes under the sphincter muscle must be handled with the utmost care as otherwise fecal incontinence may result. All the fistulous tracts must be cauterized and it may be necessary even to cut the muscle.

Some of the advantages of the method described are that it does not cause a great loss of blood, it destroys the tubercle bacilli, closes the lymphatics, and is followed by only slight after-pain.

For the first two days following the operation the wound is treated as a burn. Iodine, 25 per cent argyrol, or 50 per cent enzymol is applied as a wet dressing.

R. R. MUSTELL.

#### LIVER, GALL-BLADDER, PANCREAS, AND SPLEEN

Rehfuß, M. E.: *Analysis of Diseases of the Gall-Bladder and Ducts. Med. Clin. N. Am.*, 1920, iii, 1223.

Rehfuß considers the anatomy and physiology of the biliary system and quotes MacCarty as stating that the stomach, duodenum, pancreas, gall-bladder, bile-ducts, and liver must not be separated functionally, but considered even pathologically as a single physiological system.

The gall-bladder is subject to the same pathologic processes as other organs of the gastro-intestinal tract except that, because of its peculiar function and the tendency of altered bile to stagnate, the formation of calculi also occurs.

Acute cholecystitis is nearly always due to bacterial infection of the gall-bladder. Less frequently toxins may be the cause. The gall-bladder may become infected in three ways:

1. By way of the blood stream in which, as a result of septicæmia and pyæmia (not infrequently in pneumonia and influenza) the organism is carried directly to the gall-bladder. This mechanism includes the so-called elective localization of organisms in the gall-bladder wall (streptococci, Rosenow).
2. By ascending infection from the intestinal tract (duodenitis).
3. By the elimination of the organisms in the bile and their accumulation in the gall-bladder.

The colon, influenzal, and typhoid groups are believed to enter the gall-bladder in this way.

The bacteriology of acute cholecystitis represents not merely the colon and typhoid group of bacteria but also the paratyphoid bacillus, the streptococcus, staphylococcus, and pneumococcus.

The forms of acute cholecystitis depend on the extent and severity of the lesion and are classed as acute catarrhal, membranous, suppurative, phlegmonous, and gangrenous. The symptoms are:

1. Generalized abdominal pain due to the association of the branches of the celiac axis and the vagus.
2. Pain over the gall-bladder area at the intersection of the right costal cartilage (ninth) and the border of the right rectus.
3. Not infrequently referred pain to the right shoulder due to the association of the phrenic and supra-acromial nerves through the fourth cervical plexus.
4. Upper right rectus rigidity due to the association of the splanchnics and the intercostals.
5. Nausea and vomiting due to the splanchnics and vagi and later to toxæmia and peritonitis.
6. Localized tenderness over the gall-bladder area.
7. The general signs of peritonitis if peritonitis is present.
8. Leucocytosis if there is inflammation with pus.

The differentiation must be made from appendicitis, acute hepatitis, pyelonephritis, and subphrenic abscess.

Chronic cholecystitis is nearly always the result of repeated acute attacks, although in certain instances it begins as a chronic, persistent infection of low virulence. There are many forms of the condition which vary from the "strawberry gall-bladder" described by MacCarty to forms in which the predominating features are atrophy and adhesions causing considerable deformity in the neighboring organs. The diagnosis may be based on attacks of colic (stone) with persistent local tenderness or local physical signs during an acute exacerbation.

Tuberculosis has been held responsible for the fistula associated with cholecystotomy but its presence in the gall-bladder is rare as is also that of actinomycosis and syphilis.

Cysts, adenomata, and papillomata of the gall-bladder are other infrequent affections. Sarcoma may affect the gall-bladder, but the most frequent malignant disease is carcinoma. In from 70 to 90 per cent of the cases of carcinoma gall-stones are found, and the belief is therefore held by many that the calculi are responsible for the carcinoma.

In the study of gall-stones consideration must be taken of: (1) their etiology; (2) their clinical manifestations which vary according to the localization and extent of the stone formation; and (3) the attitude to be adopted toward their presence.

The etiological factors of stone formation may be grouped under three heads: (1) stasis of bile; (2) infection of bile; (3) alteration in bile.

Stones vary in number from one to many thousands. Most of them are faceted or rounded off, but occasionally a mass of concretions, usually of the pigmented variety, show no sign of faceting and are sharp and prickly.

Gall-stones give rise to symptoms which vary according to their position and the simplest way to approach the problem is to consider them from the standpoint of their position. A stone may be situated: (1) in the gall-bladder, (2) in the cystic duct, (3) in the common duct, and (4) in the ampulla of Vater. In a given case stones may be found in one or more of these positions. The important point to bear in mind is the mechanism by which these different forms act.

Stone in the gall-bladder acts reflexly, not mechanically. Therefore it does not give rise to the phenomena of obstruction and unless there is pronounced irritation and infection of the gall-bladder wall it is not associated with colic.

Stone in the cystic duct produces biliary colic, but is non-obstructive so far as the flow of bile is concerned. Stone in the common duct produces the typical colic associated with obstructive jaundice. Stone in the ampulla of Vater is frequently associated with pancreatic disturbances.

Cholelithiasis must be differentiated from renal colic, cholecystitis, perforating gastric or duodenal ulcer, pancreatitis, intestinal obstruction, angina pectoris, appendicitis, and the various forms of peritonitis.

In making a diagnosis of gall-bladder disease the patient's history as well as the physical examination must be taken into consideration. If gall-bladder disease is present the physical examination will reveal tenderness, hyperæsthesia, rectus rigidity, or a palpable tumor.

In the chemical analysis of the gall-bladder an attempt should be made to determine the quantity and quality of the bile output either directly, by duodenal intubation, or indirectly, by means of fecal analysis. The author discusses these tests in detail.

To reach a diagnosis of gall-bladder disease a correlative diagnosis must be made by carefully reviewing and comparing the etiologic, symptomatic, physical, and chemical evidence. In every case of chronic gastro-intestinal disease in which a pathologic condition of the gall-bladder is suspected all of the methods mentioned should be applied.

G. W. HOCHREIN.

**Lyon, B. B. V.: Some Aspects of the Diagnosis and Treatment of Cholecystitis and Cholelithiasis.**  
*Med. Clin. N. Am.*, 1920, iii, 1253.

Lyon presents the history of a patient, 47 years of age, whose case had been diagnosed as cholelithiasis, cholecystitis, and choledochitis. He had been perfectly well until he contracted influenza during the epidemic of 1918. He was considerably weakened by this attack and never felt entirely well afterward. He stated that he had never been sick in his

life, but cross-questioning revealed the fact that for nearly twenty-five years he had had attacks of headache which occurred about once a month and lasted for two or three days—blinding headaches with dancing black specks before the eyes. These headaches varied from occipital to temporal to frontal in location, and when most severe were associated with vertigo which occasionally caused him to fall. At the height of an attack he would break out in chilly cold sweats and occasionally vomited. The condition was relieved only by calomel and salts.

Eight months after the attack of influenza sudden attacks of epigastric distress began, ushered in by nausea followed by pain which was at first of a "smothery" type and later cramp-like, but not referred to the back or either shoulder. On one occasion there was retention vomiting. Toward the end of an attack, which usually lasted from a few hours to a day, a very mild jaundice developed which continued for a few days and was associated with a somewhat diffuse epigastric soreness. The stools were offensive and "gassy." In four months the patient lost 31 pounds.

On examination the abdomen was negative. There were no special points of tenderness. The urine contained only slight traces of albumin. The phenolsulphonaphthalein test showed 68 per cent of elimination in two hours. The blood showed a moderate secondary anæmia and a normal leucocyte count. The Wassermann reaction was sharply negative. A twelve-hour motor meal showed no gross or microscopic retention. Chemically there was no free hydrochloric acid. The total acidity was 15 per cent, and there was an instantaneous blood reaction to benzidine. Lactic acid was demonstrable. The fractional analysis of a bread and water meal showed nearly complete achylia; hypermotility; biliary regurgitation in 4 specimens; and traces of bleeding in all 8 specimens which increased as the stomach became empty.

Analyzing the symptoms there were two chief possibilities in the diagnosis, namely, gall-bladder disease and carcinoma of the stomach or its neighborhood. In favor of carcinoma were the loss of weight, progressive anæmia, pus and blood in the fasting and digesting stomach, the presence of rod bacilli suggesting the Oppler-Boas bacillus, and lactic acid. The stool examination suggested gall-bladder disease but the diagnosis was clinched by duodenobiliary direct analysis.

This examination was done with the duodenal tube and on the fasting stomach. The procedure is as follows:

Disinfect the mouth, assist the patient to swallow the tube, wash thoroughly and disinfect the stomach, and then allow the marked tube to be swallowed slowly until it passes about 3 in. into the duodenum. Attempt gently to aspirate the duodenal secretion and set the aspirated material aside for examination for catarrhal, inflammatory, and infective elements. Note whether the duodenum is bile-free. First dis-



infect and then locally douche the duodenum with 50 to 100 ccm. of a 25 per cent saturated solution of magnesium sulphate to relax the tonus of the duodenum and the circular muscle fibers (Oddi's muscle) at the terminal end of the common bile-duct. Connect up with the first aspirating bottle and note how soon bile begins to flow. Continue to collect the bile in this bottle until through the glass window in the duodenal tube a deepening in the color of the bile is noted, which will indicate that the first bile diluted with the magnesium sulphate is being replaced by pure bile. Now disconnect the first bottle, set it aside for examination, attach Bottle No. 2, and continue the collection of bile until it also changes in color and consistency. Usually it will become a deeper yellow and thicker. Detach Bottle 2, set it aside, and attach Bottle No. 3. Continue the drainage until this darker bile is replaced by a lighter lemon-yellow, limpid, and usually transparent bile. Then detach the third bottle and attach Bottle 4 into which collect as much as desired. By this means the biliary system can be drained for as many minutes or hours as necessary. All tubes, bottles, syringes, and glass receptacles used must be sterile.

On the application of this method of diagnosis in the case reported it was found that the tube reached the bile-free duodenum in twenty-two minutes and that the duodenal secretion showed evidence of a catarrhal duodenitis. After the duodenum was douched with magnesium sulphate solution bile appeared in six minutes (somewhat delayed). Cultures were examined and found to contain bacillus coli communis, pneumococcus capsulatus, streptococcus viridans, and micrococcus tetragenus.

About two weeks later the patient was operated upon by Elliott. The gall-bladder was found shrunken and contracted and with a thickened wall. It contained from 50 to 60 small unfaceted stones ranging in size from that of small granules to that of a large match-head. The bile was thickened. Cultures were reported sterile. The gall-bladder was drained by rubber tubing sewed in with chromic gut, the total duration of the drainage being eleven days. A little less than 8 oz. of bile was drained in seven days.

The patient returned to the author at weekly intervals for examination. At each visit the duodenobiliary direct analysis was made in the manner described. At the time this report was made (January) his condition was excellent.

The author considers the method described very satisfactory for the treatment of cases which do not yield satisfactorily to gall-bladder drainage.

G. W. HOCHREIN.

**Langfeldt, E.: The Partial Pancreatectomy; Investigations Regarding Experimental Chronic Pancreatic Diabetes.** *Acta med. Scand.*, 1920, liii, 1.

The author made a series of tests upon dogs to determine: (1) how glucosuria develops after partial

extirpation of the pancreas; (2) whether the removal of different parts of the pancreas gives different results; and (3) the metabolic and clinical manifestations of chronic diabetes.

A detailed account is given of experiments performed on normal dogs to obtain control tests for the subsequent tolerance tests on dogs which were operated upon. By these experiments it was demonstrated that both young and full-grown dogs have an extraordinarily high glucose tolerance.

In tests of the glucose tolerance following partial extirpation of the pancreas 3 of 4 dogs belonging to the same litter were operated upon (Dogs 1, 2, and 4) and the fourth (Dog 3) was used as a control. Two of the dogs were operated upon when they were puppies (Dogs 1 and 2), and the third (Dog 4), after it had become full grown. From the young animals (Dogs 1 and 2) eight-ninths and seven-eighths of the pancreas were removed respectively. For the first few months after the operation these dogs showed a reduced glucose tolerance as compared with the control animal. As they grew, however, their tolerance gradually increased both absolutely and relatively in proportion to their body weight. This period lasted about three months in the case of Dog 1 and about eight months in the case of Dog 2. After an interval of six and eight months, respectively, in which the tolerance remained apparently normal, these dogs again showed a decreased tolerance and one of them (Dog 1) developed diabetes. The other (Dog 2) was killed at this time for purposes of examination.

From the full-grown dog (Dog 4) eight-ninths of the pancreas were removed. The animal showed no increasing tolerance and developed a spontaneous and continuously increasing glucosuria immediately after the operation.

Of 2 dogs belonging to the same litter, 1 (Dog 3) was operated upon and the other was used for a control. For ten months after the removal of six-sevenths of the pancreas Dog 3 showed no decrease in tolerance for glucose, being able to tolerate up to 100 gm. (23 gm. per kilogram of body weight) without developing glucosuria. At the end of that time, however, glucosuria developed after the administration of glucose and during the next two months its tolerance still further decreased.

In tests of the blood sugar it was found that there was practically no difference between the values obtained for normal and partially depancreatized, non-diabetic dogs in a fasting condition. The values obtained lay between 0.08 and 0.09 per cent. Bang's micro-method was used.

In man, according to Jacobsen, there is a distinct relationship between glycæmia and glucosuria. Glucosuria never occurs with a glycæmia of 0.15 per cent and under, but nearly always occurs when there is a glycæmia of 0.18 per cent and over. In diabetes a glycæmia between 0.12 and 0.15 per cent gave a glucosuria.

The results of experiments to determine the relationship between glycæmia, hyperglycæmia, and



glucosuria in normal and depancreatized dogs are given in detail. The conclusions drawn are as follows:

1. The percentage of blood sugar, which normally lies between 0.08 and 0.09 per cent, may rise to 0.17 per cent without the development of glucosuria.

2. The lowest concentration of blood sugar causing glucosuria is 0.19 per cent both in normal dogs and those which have been operated upon.

3. The total amount of glucose excreted is dependent upon both the degree of the hyperglycemia and its duration for values over 0.19 per cent. Of these two factors the second seems to be the most important.

4. The concentration of glucose in the urine is proportional to the concentration of blood sugar.

The author's general conclusions from the experiments on the development of glucosuria are:

1. After partial extirpation of the pancreas, decreased tolerance for glucose is the earliest indication of an alteration in the carbohydrate metabolism.

2. Following this period of decreased tolerance for glucose a condition gradually develops which is characterized by the fact that glucosuria may be brought on by the administration of large quantities of starch but not by the ingestion of protein and fat alone.

3. This state merges into a condition in which large quantities of protein (300 gm. of meat) produce glucosuria, but this glucosuria disappears when the quantity of protein is reduced (100 gm. of meat).

4. Glucosuria then becomes manifest after the ingestion of even small quantities of protein (100 gm. of meat).

5. Finally, even after fasting, it becomes difficult, if not impossible, to overcome the glucosuria.

On dogs with the symptoms of diabetes mellitus numerous experiments were performed to study the metabolism, the quotient D/N, glucosuria after the administration of various proteins and of fat, the metabolism of protein in hunger and after the administration of glucose, and the effect of feeding ox pancreas both raw and boiled.

In the cases of 2 dogs the clinical picture of a manifest chronic diabetes of eight and thirteen months' duration respectively was observed. A slight, a medium, and a grave form of glucosuria were noted. The symptoms were polyuria and polydipsia, gradual emaciation and polyphagia, ketonuria and acidosis, albuminuria and cataract.

In the chapter on metabolism the investigations hitherto carried out on the total metabolism in diabetes mellitus in man and in experimental pancreatic diabetes are discussed exhaustively. An attempt is made to explain the genesis of the increased metabolism which the more recent investigations seem to indicate occurs in cases of grave diabetes.

The value of determining the respiratory quotient to discover whether or not a consumption of sugar

takes place in diabetes is discussed and it is concluded that this question cannot be answered in this way and is still an unsolved problem.

One hundred and seventy-nine determinations of the quotient D/N were made. In both of the depancreatized dogs the quotient D/N was slightly higher on an average than that of Minkowski's dogs with total pancreatic diabetes, i.e., 3.00 and 3.10. Values between 3.5 and 4 were observed often, and those over 4 occasionally.

Experiments in feeding various proteins showed that gelatine had the highest sugar-forming capacity and was followed in this respect by ovalbumen, meat, and casein. The fact that the patient's condition grew worse in the course of the tests cannot be disregarded, however, and the experiments must be interpreted as indicating that the difference in the sugar-forming capacity of the proteins investigated is very slight.

The administration of fat does not cause glucosuria as when the urine of a dog was not free from sugar after two days' fasting it became free from sugar on the following day after the dog was fed with fat and later showed the presence of sugar after the dog was fasted. The experiments are of interest only from a practical viewpoint and solve none of the theoretical problems.

The metabolism of protein in hunger was found to be increased in the cases of both dogs studied but did not reach the same height as that of the totally depancreatized dogs although the quotient D/N was equally high in both cases.

Determinations of the nitrogen excretion after the administration of glucose showed that the protein metabolism (N excretion) increased in pancreatic-diabetic dogs as a result of the administration of glucose per os.

Experiments in which pancreas was fed confirmed the results obtained by earlier investigators. Raw pancreas increased the glucosuria while boiled pancreas seemed to diminish it.

The relationship of hyperglycemia to ventricular secretion was also considered. Feeding tests with protein-fat showed an increase in the blood sugar in diabetic dogs. This increase coincided with the termination of the ventricular digestion and the evacuation of the ventricle and reached its highest point before the absorption was completed. Bouillon administered per os caused a great increase in a pancreatic-diabetic dog, a distinct increase in a depancreatized but not diabetic dog, but no increase in a normal dog. In diabetic animals the administration of water resulted in a distinct increase in the hyperglycemia.

After a general discussion of the results of the experiments from the standpoints of physiology, pathologic physiology, and anatomy, the author concludes that the findings in dissection combined with the experimental results seem to assign the most important rôle in the genesis of all diabetic phenomena to a primary insufficiency of the pancreas. The fact that these conditions can be



aggravated or alleviated by the action of the other endocrine organs ought to be regarded, it would seem, in the same way as the action of pharmacological substances and need not necessarily involve the supposition that there is an active reciprocal action between these organs and the pancreas.

The article is concluded with complete protocols of the experiments, a bibliography of 167 titles, and numerous photomicrographs. P. M. CHASE.

### MISCELLANEOUS

**Mayo, W. J.: The Relation of the Development of the Gastro-Intestinal Tract to Abdominal Surgery.** *J. Am. M. Ass.*, 1920, lxxiv, 367.

The derivatives of the foregut—the stomach, liver, and pancreas, and the duodenum down to the common duct—prepare the food for digestion, but do not absorb it. These organs have their blood supply from the celiac axis. The derivatives of the midgut are supplied by the superior mesenteric artery and those of the hindgut down to the rectum from the inferior mesenteric artery. Absorption occurs mainly in the derivatives of the midgut.

Embryologically the dividing line between the duodenum and the stomach is in the region of the common duct. The small postpyloric portion of the duodenum so frequently the site of ulcers is in a portion of the stomach and in consequence shares the stomach's susceptibility to ulceration.

The splenic flexure marks the limit of the absorbing area of the intestine. The proximal half of the large intestine does not differ anatomically from the left half. In the embryo, however, villi are found in the right half similar to the villi in the absorbing area of the small intestine.

The pancreas and duodenum, originally intraperitoneal organs, are rotated during development and become partially extraperitoneal. This explains why in cases of acute inflammation the pancreas may cause necrosis of the retroperitoneal as well as the intraperitoneal fat.

The proximity of the retroperitoneal portion of the duodenum to the right kidney is of great surgical importance. In operations upon the kidney, especially in cases of malignant disease or chronic inflammation about the pelvis, the duodenum may be injured.

The large intestine, originating on the left side of the body, rotates to the right, reaching its normal situation shortly after birth. Failure to rotate completely may give a confusing surgical picture in later life.

The small intestine has its mesenteric attachments confined to a 6 in. base passing behind the umbilicus. This explains why most diseases of the small intestine cause pain referred to the umbilical region.

The upper jejunum is thick and wide and may be recognized by its thin mesentery with large, long, and straight vessels and having but one or two primary arcades close to the base. In the lower

ileum the intestine is thin and the mesentery thick, the vessels are smaller and shorter, and there are several superimposed arcades.

Beside initiating action the central nervous system has only a slight influence in vegetative life. It controls the function of viscera more recently added, organs of convenience such as the fundus of the stomach, the sigmoid portion of the colon, and the bladder.

A number of visceral functions are dependent on non-striated muscle fibers. Keith has described a system of nodes composed of muscle cells and autonomic nerve fibers. Careful study of this system with reference to the heart has demonstrated that it controls also the action of the gastro-intestinal tract. Keith suggests that the nodes act like a block system on a railroad, controlling food progress by their action on the various sphincters. Food passing through the pharynx stimulates the first node and from there impulses are carried to a second node situated at the cardiac end of the stomach. The third node is at the termination of the primitive foregut near the common duct, and the fourth at the duodenojejunal juncture. The fifth node is found at the ileocecal valve and is of importance in relation to stasis in this region. The sixth is near the middle of the transverse colon and is responsible for the retention of food products in the right half of the large intestine. The seventh is in the recto-sigmoid area. The eighth is concerned with rectal control.

The sympathetic nervous system which correlates visceral action stimulates the function of the endocrine glands and is in turn stimulated by their action. The hormones or secretions from these glands act through the blood stream and are important in visceral control.

A. J. SCHOLL, JR.

**MacMillan, A. S.: Diaphragmatic Hernia.** *Am. J. Roentgenol.*, 1920, n. s. vii, 143.

Among approximately 15,000 patients examined in the roentgen laboratory at General Hospital No. 1, 3 cases of diaphragmatic hernia were found. In each, the diagnosis was made first by the roentgenographic examination. The case histories are given in detail.

Two of the patients had received chest wounds which probably accounted for the opening in the diaphragm. In 1 case both the stomach and colon passed through the opening which apparently was large enough to cause no embarrassment in the emptying of either of them. In the other case only a part of the stomach protruded but this had become strangulated and there was almost complete gastric retention. In the third case there was no history of trauma. The hernia developed after pneumonia and empyema. Part of the stomach and colon extended through a rather small opening in the diaphragm but there was no apparent interference with their emptying. The opening was either of congenital origin or, as is more probable, due to the operation for empyema.

ADOLPH HARTUNG.

**Hirsch, E. F.: Retroperitoneal Liposarcoma: Report of an Unusually Large Specimen, with Chemical Analysis.** *Am. J. M. Sc.*, 1920, clix, 356.

The author reports a retroperitoneal liposarcoma, the largest and most extensive reported to date, and gives a short résumé of the literature.

When first seen, the patient, a man 55 years of age, complained of dyspnoea, moderate cough, and swelling of the abdomen and feet which were associated with progressive weakness and had persisted for eighteen months. On examination, nodular masses were found in the abdomen which was irregularly dull. Paracentesis withdrew only 5 ccm. of fluid. This contained large lymphoid cells and many eosinophiles showing peculiar mitotic figures. A diagnosis of peritoneal carcinomatosis was made.

During the next two years the patient was seen twice. Examination disclosed progressive enlargement of the abdomen, increasing emaciation of the head and upper part of the body, and a chronic nephritis. Because of the length of time that had elapsed since the beginning of the symptoms, the condition was believed to be of a cystic character.

At operation a large tumor mass was found between the anterior layers of the mesentery and numerous smaller masses scattered throughout the abdomen. The large tumor, which weighed about 14,340 gm. was removed but the patient died within forty-eight hours.

At autopsy the anatomical examination revealed a retroperitoneal, oedematous fibro-liposarcoma; slight ascites; compression of both lungs; acute hypostatic and aspiration pneumonia; upward dislocation of the heart; pressure atrophy of the liver; occlusion of the left common iliac vein; oedema and varicose veins of both legs; early varicose ulcers of the right leg; chronic oedema of the external genitals; a tumor mass in the right inguinal canal; and fibrosis of the right testicle.

The chemical analysis of the tumor mass resembled that of a granulation-tissue tumor. P. M. CHASE.

**Elder, J. M.: An Unusual Case of Retroperitoneal Congenital Cyst Probably Arising from the Wolffian Body.** *Canadian M. Ass. J.*, 1920, x, 272.

A girl, 2 years old, who was struck by an automobile, was brought to the Montreal General Hospital with hæmaturia and complaining of pain in the right side of the abdomen. A diagnosis of rupture of the

kidney was made. For a week there was intermittent fever, which finally disappeared by lysis. The X-ray examination was negative. At the end of three weeks a fluctuating mass which gradually increased in size was felt in the right side of the abdomen. On needle aspiration of this supposed perirenal hæmatoma clear fluid with a low percentage of albumin and no urea was found.

A right rectus incision was made. The abdominal contents were found pushed to the left by a right retroperitoneal cyst. This cystic cavity was opened posteriorly and a large amount of clear fluid removed. The upper end of the cavity was connected with the right kidney and the lower extremity with the right ovary and fallopian tube.

The cyst was sutured to the skin and the cavity swabbed with tincture of iodine and packed with flavine gauze. The abdominal cavity was then closed in the usual manner without drainage. The packing and swabbing were repeated postoperatively and the wound closed in twenty-seven days.

On microscopic examination of a portion of the cyst wall no embryonic structure was found. From its location and character the cyst was judged to be a cyst of the Wolffian body. W. F. HEWITT.

**White, C. S.: Mesenteric, or Enterogenous, Cyst.** *J. Am. M. Ass.*, 1920, lxxiv, 440.

Only 35 cases of mesenteric or enterogenous cyst were reported in the literature up to 1913, and in none of these was the diagnosis made prior to operation or necropsy. The etiology of the condition is not definitely known. The tumor is invariably congenital and situated at the mesenteric attachment of the small intestine.

In this article is reported the case of a child 4 years of age in whom such a cyst was found at operation.

"The conspicuous and significant symptoms were the resilient, freely movable tumor with intestinal obstruction of an intermittent type, a low leucocyte count, sudden onset and rapid recovery in each attack, and the age of the patient." A thorough X-ray examination was made, but the reports were misleading.

The operation was performed three years after the first symptoms. The enterogenous tumor was removed by resection of the intestine.

A. R. HOLLENDER.

## SURGERY OF THE EXTREMITIES

### DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

**Corlette, C. E.: A Case of Hydatid Infestation of Bone with Multilocular Hydatid Disease.** *Lancet*, 1920, cxcviii, 311.

Cystic disease caused by the *Tænia echinococcus* is prevalent in Australia. The case reported in this article was seen at the Sidney Hospital and was

remarkable principally because of the similarity between the bony and the soft-tissue lesions. Hydatid cysts in bones as described by Virchow are usually of the multilocular type, while the lesions in the soft tissues are usually single cysts. From this fact it has been concluded by some observers that the two conditions are due to two distinct parasites.

The symptoms in the author's case were tumor and pain which had been present for eight years.



At operation an irregular cystic mass was discovered with granular semi-fluid contents. This cyst involved the shaft of the femur and the iliac bone. The head of the femur and the acetabulum had been destroyed, the iliac bone was honeycombed, and the mass extended into the abdomen as high as the liver.

The tumor contained several pints of the characteristic granular material and this contained an enormous number of hydatid cysts. Most of the cysts were small, though some reached 2 cm. in diameter.

On microscopic examination the cysts showed the typical striated cuticle, but no scolices or hooklets. The kidneys, liver, and left lung were free. The upper lobe of the right lung showed the condition unusually associated with a multilocular cyst in the apex. The similarity of the two lesions indicates the identity of the organism.

In similar cases in which lesions have been found in both bone and soft tissue the bony lesions have been thought to be due to emboli passing through the portal system to the general circulation. In the case reported the duration of the bony symptoms and the absence of pulmonary symptoms indicated that the lung lesion was secondary to the lesion in the bone.

J. I. MITCHELL.

**Dwyer, H. L.: Chondrodysplasia; Multiple Cartilaginous Exostoses.** *Am. J. Dis. Child.*, 1920, xix, 189.

Dwyer reports 4 cases of chondrodysplasia, 3 of which occurred in one family. X-ray plates of Cases 1 and 3 and the pathologic reports of the specimens removed from Cases 1 and 2 are given.

**CASE 1.** A girl aged 7 years, of Italian parentage, but born in America. Lesions on the humeri, the radii, the clavicles, the tibiae and the phalanges of both hands. These lesions were for the most part in corresponding areas.

**CASE 2.** A boy of 20 months, born in America. A mass on the right scapula and the third digit of one little finger.

**CASE 3.** The father, aged 29, who was born in Italy. A bony mass on each tibia just below the tuberosities.

**CASE 4.** A boy of 12 years, of another family. Lesions on the left radius, the great metatarsal, the right external malleolus, the left popliteal space, and both tibiae. Two brothers of this boy had had growths removed from their limbs.

The author's summary is as follows:

1. There are many variations of hereditary deforming chondrodysplasia from the multiple small cartilaginous exostoses, which give no trouble, to great deformities causing dwarfing, paralysis, aneurism, and malignancy.

2. The disease manifests itself in infancy.

3. The condition has much in common with the chondrodystrophies of infancy and adolescence and probably is closely related to them.

C. R. STEINKE.

**Bolognesi, G.: The Establishment of the Collateral Vascular System in the Limbs** (Su la formazione del circolo collaterale degli arti). *Chir. d. organi di movimento*, 1919, iii, 403.

Bolognesi performed experiments to determine the effect of ligating the external iliac artery in dogs. The ligation was done with a double catgut ligature under perfect asepsis and by the extra-peritoneal route. For the first two days following the ligation the femoral pulsations disappeared but soon thereafter returned to normal. The animals were killed after varying periods of time and the vascular systems of both limbs studied with the X-ray after the vessels had been injected. The results of this study are summarized as follows:

1. The arteries below the ligation were found to be enlarged and to possess more numerous secondary branches than those of the corresponding area on the normal side.

2. There was no return of circulation in the tract of the ligated external iliac artery at the end of one month but after two or three months a true collateral circulation had been established which was represented either by communicating arterial branches or by complete restoration of the segment of the main artery which had been excluded between the two ligatures.

3. The gluteal branches of the iliac artery, and especially those of the inferior or ischiatic gluteal artery, took part in the formation of the collateral circulation, becoming larger and richer in branches. These branches anastomosed fully with the femoral branches.

The results verify the theory as to the establishment of collateral circulation which was brought forward by Porta as far back as 1845. They demonstrate also that the increase in size of the pre-existing collateral arteries is of greater importance than a very great increase of newly-formed vessels. This vascular dilation persists until the collateral circulation established is sufficient.

W. A. BRENNAN.

**Behrend, M.: Acute Osteomyelitis and Periosteitis Complicating Epidemic Influenza; Report of Five Cases; Radius Removed in One Case; Review of the Literature of Excision of the Radius.** *Surg., Gynec. & Obst.*, 1920, xxx, 273.

The fact that dangerous complications result if an acute osteomyelitis is not operated upon has not been fully realized by the profession. The destruction of tissue and in some instances the threatened death of the patient make it just as imperative that operation should be done in such cases as in cases of appendicitis and the measures used should be just as radical. The sooner the medullary canal is opened, the better will be the ultimate functional result. The only safe procedure is the removal of the entire roof of the bone. This insures adequate drainage, thereby shortening the healing process which is a long process at best.



A review of the recent literature reveals no reference to acute osteomyelitis as a complication of influenza. The author reports 5 cases.

The period of onset of the condition varies, the manifestations appearing weeks after the acute symptoms have subsided. In 2 of the author's cases an interval of five weeks elapsed before the symptoms of acute osteomyelitis appeared.

The literature of removal of the radius is reviewed and the case histories of the author's 5 cases of acute osteomyelitis following influenza are given.

H. A. MCKNIGHT.

**Delitala, F.: Trophic Changes in Stumps of the Lower Limbs** (Modificazioni trofiche nei monconi di arto inferiore). *Chir. d. organi di movimento*, 1919, iii, 535.

In a study of 650 cases of amputation of the lower limbs the author made the following observations:

1. The perimeter of the stump of an amputated thigh is less than that of a normal thigh. This difference is more evident the longer the period of time since the amputation.

2. The difference in the perimeters of a normal and an amputated thigh is directly proportional to the development of the thigh muscles.

3. Muscular atrophy is more manifest in long thigh stumps than in short stumps. It is greatest at the apex and least at the root of the stump.

4. It is not possible to determine just when the process of muscular atrophy ends. The most important trophic changes occur within six months but the complete process may take two years. The trophic change which occurs within the month following amputation is scarcely perceptible.

5. The difference between the perimeter of an amputated and a normal thigh at the root varies from 4 to 6 cm. in patients who have never used prosthetic apparatus. In those who have used such apparatus it is about 9 cm.

6. In stumps of the legs below the knee the atrophy is least at the head of the bones. At this level the difference in the perimeter of the amputated stump and a normal leg is about 2 cm. while at the extremity of the stump it is about  $5\frac{1}{2}$  cm. When a prosthetic apparatus has been used the decrease in the upper perimeter is 4 cm. The other observations made regarding thigh stumps apply also to stumps of the lower legs. W. A. BRENNAN.

## FRACTURES AND DISLOCATIONS

**Simon, W. V.: Spontaneous Fractures in the "Starvation Osteopathies" of Youth** (Zur Frage der Spontanfrakturen bei den Hunger-osteopathien der Adolescenten). *Arch. f. Orthop.*, 1920, xvii, 364.

Two cases of spontaneous fracture treated by the author are reported. As the fractures could not be attributed to any of the usual causes, Simon believes they were preceded by bone absorption. They occurred in the middle of the diaphysis of the tibia

and the horizontal ramus of the pubis. The cause of the primary absorption is not clear. The treatment consisted of massage, artificial heliotherapy, the administration of arsenic, and injections of adrenalin.

HOHEIMER (Z).

**Arnold, I. A.: Open Treatment of Fractures.** *Am. J. Surg.*, 1920, xxxiv, 87.

According to Arnold the open method of treating fractures should be used when: (1) there is considerable displacement of fragments that cannot be otherwise corrected; (2) complete reduction cannot be secured by manipulation; (3) manipulation causes undue trauma to other structures; (4) there are spiculæ of loose bone and soft tissue between the fragments; (5) the fragments are rotated upon each other and cannot be maintained in proper position; (6) the fractures are spiral and multiple; (7) the fractures involve either nerves or blood vessels; (8) the fractures are ununited or in vicious union; (9) the fractures are complicated by dislocation and in close proximity to joints; (10) in any fracture of the femur the anatomical apposition is faulty.

The operative technique in cases of intra-articular fractures is very difficult and should be undertaken only by an operator with considerable experience in bone work. For success the surgeon must have a thorough knowledge of the anatomy of the region to be operated upon and understand the action and function of the muscles and ligaments involved in the injured member.

An experienced surgeon with mechanical skill can often obtain excellent results also by non-operative methods.

The reduction of fractures should always be checked with the X-ray to determine whether or not the fragments are in perfect apposition. It should be borne in mind, however, that the X-ray often seems to exaggerate the deformity when the angle at which the picture was taken is unknown.

Open operation should be performed because: (1) as a rule it insures better functional results than the closed method; (2) it is more apt to give perfect anatomical apposition; and (3) if bone grafts are used, it secures earlier union.

In non-infected fractures operation should be performed as soon as possible after the injury, i.e., within five or six hours. If the patient is not seen until twenty-four hours after the injury and there is evidence of considerable damage to the surrounding soft parts either from the initial injury or attempted reduction, operation should be postponed for ten or fifteen days or until the condition of the tissues has become more normal.

In bone grafting Arnold employs only autogenous grafts and metal fixation. Strict asepsis is a fundamental requisite for success. When the incision is made the anatomy of the important structures should be carefully examined with proper instruments (not with the hands) to determine whether an inlay, a medullary, or a sliding graft would be best. If an inlay or sliding graft is to be used, the piece of bone



or graft should be cut so that it will fit snugly into the groove made to receive it. This inlay or graft must include the periosteum, compact bone, and endosteum. It should be so placed that intimate contact is secured between periosteum and periosteum, compact bone and compact bone, endosteum and endosteum, and should be retained by autogenous bone-pegs or kangaroo tendon to obtain perfect apposition.

The author uses a single saw to cut the graft. To insure the life of the graft it is important to keep the speed of the motor at such a rate that the heat generated will not destroy the bone cells. It is inadvisable to have water flowing over the saw to cool it as this will wash away material that should remain in contact with the bone.

If an intramedullary graft or dowel is used, all periosteum must be removed from the part which extends into the canal of the bone. When substance has been lost from the ends of the fragments, the periosteum should be left on the graft in that space. Perfect hæmostasis must be maintained in this as well as in the inlay method as a blood clot may separate the soft structures from the bone and as a result the graft will be poorly nourished.

As regards fixation, it must be borne in mind that bone grafts or pegs are used to promote union and maintain the fragments in direct apposition and continuity. Their purpose is not to give strength. It is essential, therefore, to handle the part grafted with care and immobilize it completely in a plaster of Paris cast which includes one or more joints above and below the graft.

In discussing internal fixation by metal, such as wiring, nailing, and plating, the author states that in the presence of infection plates should be used in preference to grafts. The same precautions as to asepsis and the same care in the handling of the tissues should be taken in plating a simple fracture as in grafting.

Wiring and nailing have a place in the treatment of certain types of fracture, but their field is limited.

In operating upon a compound infected fracture the original opening should be enlarged sufficiently to facilitate the work. All scar tissue, sequestra, callus, and fragments of bone the viability of which is doubtful should be removed.

The plate used should be as long as the anatomy of the part will permit, preferably a six-screw plate. Plates should be removed as soon as the bones are sufficiently united to prevent displacement of the fragments.

G. W. HOCHREIN.

**Hughes, B.: The Use of Autogenous Bone Grafts in the Treatment of Certain Simple Fractures of Bone.** *Lancet*, 1920, cxcviii, 595.

While the majority of fractures can be reduced without open operation, simple fractures, such as those near the hip or shoulder joints, and spiral fractures of the lower third of the tibia are best reduced by open operation and the use of autogenous bone grafts.

In order that a bone graft may grow and function it must be autogenous, it must be implanted under the strictest asepsis, and it must include the periosteum as well as the endosteum so that union may be hastened by vascularization. When such a graft has begun to unite a certain amount of movement is beneficial.

Three theories regarding the formation of new bone after grafting have been advanced: (1) the graft is absorbed and new bone is formed from the periosteum; (2) new bone is formed by the proliferation of the osteoblasts within the graft itself; and (3) the bone graft acts as a scaffolding for the osteoblasts from the adjacent bone. These theories are contradictory chiefly because some writers believe the periosteum includes the true cambium of the bone while others do not. If the periosteum does include the true cambium of the bone all of them are in part correct. Roentgenograms have shown rarefaction about the periphery of the graft and new bone formation within the graft itself.

Plates and screws are foreign bodies which will sooner or later produce a rarefaction, or even supuration, of the bone about them. This may occur as late as four years after the operation, especially if the bodily resistance is lowered. In a number of cases non-union has resulted from the use of plates. An autogenous graft is living tissue which in time becomes a part of the bone into which it was introduced and acts according to Wolff's law.

Particular stress is laid on the importance of asepsis. It is recommended that two or three inoculations of staphylococcus aureus vaccine be given prior to the operation. Because of the very disappointing results often obtained in the cases of patients with certain diseases, it is important also to determine whether a condition such as malaria, syphilis, skin infection, an infectious fever, albuminuria, glycosuria, etc. is present.

The bone graft should consist of the periosteum, the compact bone, and the endosteum. At the end of three weeks the patient should begin to exercise the extremity a little. The graft is usually united with the bone at the end of the sixth week, and use of the limb may be begun two weeks later.

The author considers the autogenous bone graft far superior to plates and screws in open operations for simple fractures.

B. R. PARKER.

**Todd, A. H.: Dislocation of the Shoulder Joint and Its Treatment.** *Practitioner*, 1920, civ, 186.

The after-treatment of dislocation of the shoulder is usually very poor. This after-neglect and slavish adherence to traditional methods are responsible for many unsatisfactory results. The disability following the injury is prolonged and in some cases permanent. According to the records of one insurance company the average time a patient is kept from work is twelve weeks.

The usual trouble after treatment of the dislocated shoulder in the traditional position—that is, with the arm bandaged to the side—is limitation of



abduction which is due to adhesions around the lower part of the joint capsule where the tear occurred. These adhesions can be broken up by forcible abduction, but as most of the patients are elderly they are not able to stand such treatment. Furthermore, manipulation of this kind tends to cause arthritic changes in the joint.

To obviate this difficulty a Middeldorf triangle was used in one or two cases, and as the results proved very satisfactory the plan of putting the arm up at right-angle abduction on a splint was generally adopted. The splint may be of celluloid, papier maché, or sheet metal, but must hold the arm out at a right angle and furnish support for the forearm as well.

The inferior part of the joint capsule is very thin and has no muscular re-inforcement. When the arm is hanging at the side this part of the capsule is thrown into redundant folds. It is in this mass of folds that the adhesions occur after the trauma and in old cases the arm may be bound absolutely to the side. If the dislocation is treated with the humerus in abduction at 90 degrees the capsule is stretched out below, the folds are obliterated, and the tear in the capsule is closed with the torn edges in apposition by virtue of the tension produced in the tissue by the abduction. Another advantage is that the muscles passing from the trunk to the humerus are tight in abduction and tend to hold the head firmly in the glenoid fossa, whereas in adduction they are lax and serve no good purpose.

The text-book teaching of binding the arm to the side is therefore condemned as a bad practice. One reason advanced for the adduction method is that it prevents recurrence of the dislocation, but not one patient treated by abduction had a recurrence, while among those previously treated by the adduction method, two have had a chronic recurrence ever since. It is urged that in actual practice abduction gives better results than the old method with less pain, no risk, and a shortened disability time. The author's standard procedure is to abduct the arm immediately after reduction and maintain it at 90 degrees on a splint. No movement is allowed in the shoulder at first, but the rest of the arm is moved freely and massaged. The arm is taken off the splint in from ten to fourteen days and then carried at the side in a sling for a week more. The patient is urged to practice swinging the arm and to rotate and abduct it. Increased abduction is sought for each day. A good plan is to have the patient reach up on a wall, marking the level daily. Circumduction is the final movement to be attained and the patient is not discharged until he can raise the arm steadily and interlock his thumbs over his head.

The analysis of the results in a group of 52 cases shows that the longer the arm was bandaged to the side (9 cases) the longer it took to obtain even a mediocre result and that all patients who were treated by abduction were able to raise the arms well above the head.

W. A. CLARK.

**Jones, E.: The Treatment of Fresh and Ununited Fractures of the Femoral Neck.** *California State J. M.*, 1920, xviii, 92.

Jones cites numerous statistics to prove that the usual methods of extension, suspension, and traction in the treatment of fractures of the femoral neck have given the poorest functional results. He believes that traction in the straight line of the body in loose intracapsular fractures of the neck of the femur never gives firm bony union as accurate anatomical reduction cannot be obtained by this method.

The author describes the Whitman abduction method in detail. The steps are: (1) induction of light anaesthesia; (2) manual or mechanical traction and extreme abduction of the leg; (3) rotation of the leg internally, the trochanter being brought forward; (4) the application of a plaster spica from the toes to the nipple line, the leg being slightly inverted and strongly abducted; (5) elevation of the head of the bed; (6) the wearing of a cast for three months; and (7) no weight bearing for six months.

Cotton's method, which is based on the fact that impacted fractures of the femoral neck almost invariably unite, is also described. In a fresh fracture reduction is effected by traction and abduction until the legs are equal, and an artificial impaction then made by driving the distal fragment into the head of the bone. A loose fracture is thus converted into an impacted fracture.

The author used a combination of these two methods in 6 cases and obtained very favorable results.

After the patient was anaesthetized the Whitman method of abduction was employed. The fracture was then impacted by Cotton's method and a plaster cast applied with both legs in extreme abduction. The cast was applied from the toes to the nipple line on the affected side and down to the knee on the other side. The purpose of such a full and thoroughly applied spica was to maintain absolute abduction and prevent slipping of the pelvis. Weight bearing was not permitted for eight months.

In cases of non-union the author condemns the use of tibial bone grafts as it is often unsuccessful. Instead, he advocates the removal of the head and an arthrodesis of the hip joint. A. R. HOLLENDER.

**Strange, C. F.: Fractures of the Tibia and Fibula; Their Treatment by Plating Operations.** *Lancet*, 1920, cxcviii, 537.

The author reviews in detail the histories of 15 cases of tibial fractures treated by plating operations. The best results were obtained when the operation was performed shortly after the injury. Fourteen to twenty-one days is considered the optimum period. In cases of long standing it is generally necessary to fracture and mobilize the associated fibular callus.

The incision made is from 10 to 12 in. long and external to the tibial crest. This gives satisfactory exposure without jeopardizing important nerves



or blood vessels. A complete set of Lane's special plating instruments and at least three assistants are essential.

Long plates with sufficient space for 3 screws in each fragment are used. The plates are applied to the external surface of the tibia as in this region they are tucked in between the fibula and tibia and out of the way of the tendons which pass to the foot.

The plates and screws are kept in boiling water until needed and then are handled only with instruments. The operator does not touch the patient with his hands. Small bleeding vessels are ignored, and the incision is closed with clips. The operation is carried out without the use of a single ligature or stitch. The repaired fracture is supported in a Thomas splint for several weeks, the limb then being put on a back-splint with a foot-piece. Usually after three months sufficient callus has formed to permit walking.

The author emphasizes the point that a plate is used merely as a support or scaffolding to hold the fragments in proper alignment until new bone forms.

A. J. SCHOLL, JR.

#### SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

**Henderson, M. S.: The Use of Beef-Bone Screws in Fractures and Bone Transplantation.** *J. Am. M. Ass.*, 1920, lxxiv, 715.

Henderson holds that technical errors are responsible for the majority of failures in bone grafting. One of the most common errors, poor approximation of the graft to the bone, is overcome by the use of beef-bone screws. These screws are well tolerated by the tissues and are gradually and completely absorbed in from six to twelve months.

Fresh beef bone is obtained usually from the tibia, boiled one and one-half hours, and then cut and sawed into suitable blocks. The blocks are placed in warm petrolatum for several hours in order to replace to some extent the natural oils removed by the original boiling. Care is taken to keep the bone from becoming overheated as this renders it chalky. The sections are next placed in a lathe where they are cut and threaded into several sizes corresponding to those of standard machine screws. In threading the smaller screws it is necessary to step down the thread very gradually, using several different dies.

The screws are brittle and will stand only a small amount of torsion or strain. In cases in which cortical bone is passed through, it is necessary to drill and tap the hole before placing the screws. The drilling may be done with the electric or the hand drill, but the tapping must be carefully done by hand.

Beef-bone screws have been very efficient in maintaining coaptation in spiral and oblique fractures of long bones, fractures of the neck of the femur, fractures of the olecranon, and certain fractures of the patella. The author has found them excellent

also in fixing bone grafts to the spinous processes as in the Albee operation for tuberculosis of the spine.

In delayed union and ununited fractures Henderson transplants a very large graft, using as a rule a piece of the tibia or the entire thickness of the fibula. In order to meet the flattened surface of the graft one side of the bone is surfaced for a good distance above and below the fracture. Two or more beef-bone screws are then placed through the remains of the proximal cortex and the opposite cortex of each fragment.

The author endeavors to have at the completion of his operation about 25 per cent more bone in the fracture area than there is normally.

A. J. SCHOLL, JR.

**Babcock, W. W.: Further Observations on a New Method for the Immediate Sterilization and Closure of Chronic Infected Wounds of Bones and Soft Tissues.** *Am. J. Surg.*, 1920, xxxiv, 81.

The author believes that the forcible injection of a strong solution of zinc chloride into bony sinuses may lead to the penetration of small blood vessels and such a sudden entrance of the caustic into the blood stream that the central organs are reached before the chloride can be neutralized. As a result, a very serious, if not immediately fatal condition may develop. This may be avoided by keeping a proximal tourniquet applied during the injection of the chloride solution and for five minutes thereafter. If the sinuses involve parts of the body, such as the pelvis or throat, which cannot well be shut off by a tourniquet, the sinuses should be carefully packed with small pledgets of cotton moistened with the zinc solution. A second danger of the method to which attention is called lies in the operator's failure to excise all chlorided tissues before closing the wound.

If the precautions indicated are carefully followed, however, the method does not add to the danger of the operation and greatly reduces the later morbidity. In the after-treatment experience has emphasized the importance of rest, very careful support, and accurate fixation.

Irrigations or injections into the wound are contra-indicated and as a rule the use of drains in the after-treatment is to be avoided. The patient should be kept in bed the first two weeks and wet mildly antiseptic dressings should be applied continuously. Babcock has found that in these closed cases Dakin's solution is harmful.

None of the author's patients had been treated less than seven months before the method was tried. Most of them had received months of Carrel-Dakin treatment, and the number of previous operations varied from one to nine. In Babcock's opinion from 70 to 94 per cent of chronic bone sinuses can be closed successfully by the method described, the percentage depending upon the thoroughness of the treatment, the character of the lesion, and the degree of destruction of the adjacent soft tissues.

The method is especially adapted to the treatment of osteomyelitis, septic compound fractures, chronic abscesses, and sinuses, and consists of four procedures carried out in one operation.

1. Immediate chemical sterilization of all sinuses and wound surfaces by the injection and application of a saturated solution of zinc chloride.
2. Delineation of infected areas by the injection of an ethereal solution of methylene blue.
3. Mass excision of the entire area of infection.
4. Wound closure with the obliteration of all dead spaces.

E. C. ROBITSHEK.

#### ORTHOPEDICS IN GENERAL

**Myers, A.: Personal Observations of the Early, Intermediate, and Late Treatment of 1,000 Cases of Infantile Paralysis from an Orthopedic Surgeon's Viewpoint.** *Charlotte, M. J.*, 1920, lxxxi, 95.

The author deplors the neglect of correct treatment that is evident in a great number of cases of poliomyelitis and gives a brief résumé of the ac-

cepted methods for the various stages of the paralysis. The greatest fault he considers is the use of electricity instead of absolute rest in the early stages.

In the early or acute stage the only treatment indicated is immobilization with plaster of Paris casts or braces and rest in bed followed by very slowly increased massage and muscle training with especial care not to overstretch the weakened muscles.

After the immobilization period braces are necessary to hold the joints in the corrected position for from six months to a year before strain or weight-bearing is allowed. If contractions have occurred, slight stretching may be sufficient or tendon lengthening and transplantations may be done.

For flail joints and deformities from stretched ligaments immobilization is obtained by various methods of arthrodesis and the Hibb's operation on the spine. After these conditions have been corrected and also in the late stages when atrophy is present massage and muscle training should be given daily.

R. G. PACKARD.

### SURGERY OF THE SPINAL COLUMN AND CORD

**Marshall, H. W.: The Treatment of Back Injuries with Special Reference to Spinal Fractures That Are Not Associated with Cord Symptoms.** *Boston M. & S. J.*, 1920, clxxxii, 140.

The author bases his discussion on a series of thirty cases. Spinal fracture without cord symptoms has been shown by careful diagnostic methods to be much more common than was formerly supposed. The disability is usually prolonged, but in some cases functional recovery is practically perfect. One case is cited in which the patient showed a back strength test of 320 lbs three months after the injury. No statement is made regarding the treatment given in this instance except that the spine was not grafted.

In the author's opinion the disability is due to two causes: (1) ruptures and strain of posterior groups of spinal ligaments and muscles, and (2) crushings of cancellous bodies of vertebrae with associated relaxation of anterior spinal ligaments. In cases of the first class the best results are obtained by bone grafting. After grafting the author applies mechanical support. Immobilization should not be unduly prolonged. Periods of rest and graded exercise should be alternated.

Marshall describes a back brace which is a modification of the Taylor brace and designed to prevent a twisting motion of the spine as well as bending motions. Great care should be taken to see that the brace is really efficient. In addition to the brace, massage, manipulation, and other physiotherapeutic agents should be used as well as internal medical measures and general hygiene to improve the patient's general condition. BEVERIDGE MOORE.

**Elsberg, C. A.: Concerning Spinal Cord Tumors and Their Surgical Treatment.** *Am. J. M. Sc.*, 1920, cliv, 194.

This paper is based upon 67 spinal cord tumors operated upon by the author. Primary and secondary growths of the bones are not included.

Three-fourths of the tumors were extramedullary and 62 per cent intradural. The most frequent location was between the fifth cervical and the third dorsal segments of the cord, and next in frequency, between the ninth dorsal and the first lumbar segments. As a rule the growths occurred on the posterior aspect of the cord and frequently were found to the side, behind, or in front of the posterior roots, the dentate ligament, or the anterior spinal roots. Seventy-seven per cent of the extramedullary growths were on the posterior or the posterolateral aspect.

The anterolateral tumors rarely began with root pains and before operation it was often difficult to distinguish them from intramedullary growths. From the appearance of the spinal cord it was impossible to determine whether or not the damage done was irremediable. Small hard tumors caused earlier and more severe cord lesions than tumors that were large and soft, but great improvement occurred even when the cord was markedly flattened.

The diagnosis of cord tumor was made or the presence of a cord tumor was suspected in 60 of the 67 cases and in the 7 others a tumor was considered to be one of the possibilities. The level diagnosis was correct in 48 cases. In 14, the growth was found from one to three segments above the suspected level, and in 2, one or two segments below it. In 3



cases the level diagnosis was altogether wrong and a second operation was necessary. In 2 of these cases the tumor was ten segments higher than the suspected level, and in one, six segments lower.

The technical procedures involved in the operation of laminectomy are seldom difficult. Tumors on the posterior surface are removed easily. Those under a nerve root or a slip of the dentate ligament should not be pulled out; the root or ligamentous slip should be divided. In removing tumors situated in front of the cord great care is necessary and much more of the laminæ must be removed so that access to the front of the cord may be more direct.

Of the 67 tumors, 31 were extramedullary, 11 in the cauda equina, 7 extradural, and 18 intramedullary.

The tumor was entirely removed in 39 cases and partly removed in 11. In 17 it was impossible to remove it (12 intramedullary, 3 extradural, 2 between the roots of the cauda equina).

Sixty of the patients recovered (90 per cent). Of the operations for extramedullary tumors 94 per cent were successful, while of those for intramedullary growths, 89 per cent effected a cure. A number of the patients were operated upon many years ago. The mortality of these operations should be less than 6 per cent.

BEVERIDGE MOORE.

**Zeno, A. and Boden, A.: Fistulæ and Sacrococcygeal Cysts** (Fistulas y quistes sacrocoxigeos). *Semana méd.*, 1920, xxvii, 181.

The author has made a detailed study of 28 cases of congenital fistulæ and cysts of the sacrococcygeal

region. These malformations are more common in males (25 of this series were in men and 3 in women) and as a rule are found in persons who tend toward obesity. Usually they do not become evident until early adult life, between the twentieth and thirtieth years. At first a tumor is noticed which increases in size gradually and is often painful, or a fistula is present which either discharges pus or merely soils the clothing. The patient usually considers these lesions to be due to trauma and often there is secondary infection.

The cysts are located in the median line and are not inflammatory. The fistulæ when explored with a probe are found to terminate at the end of the coccyx or sacrum. They must be differentiated from fistula in ano and tuberculous fistulæ of osseous origin.

The operative treatment should consist of complete radical excision with drainage and secondary closure, primary closure, or transplantation of fat. Drainage and secondary closure are indicated in cases of acute or subacute infection when the fistulæ are numerous and the cavity is large. Primary closure is the ideal method but can be employed only when the cyst or fistula is small and infection is slight or absent. Transplantation of fat cannot be done in the presence of infection but is very successful in non-infected cases.

As there is no tendency toward spontaneous cure, palliative treatments such as simple incision and drainage, cauterization, and the injection of caustic substances and bismuth paste always fail.

W. R. MEEKER.

## MISCELLANEOUS

### CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

**Hamel, O.: The Clinical Picture of Starvation Osteopathy** (Zum klinischen Bilde der Hungerosteopathie). *Deutsche med. Wchnschr.*, 1920, iii, 68.

Hamel reports 6 cases of starvation osteopathy. The clinical picture simulated that of late rickets ranging in severity from the mildest form to spontaneous fracture.

Mild cases are often overlooked, being regarded as due to weakening of the arches of the foot, muscular rheumatism, etc.

Four of the author's patients had had infantile rickets. In 2 cases the signs of tetany were observed. The outcome was favorable. A cure was demonstrated by the X-ray which showed the disappearance of the epiphyseal separation and the consolidation of the bone.

The treatment consisted of a substantial diet, rest, the administration of cod-liver oil, and the induction of active and intense focal hyperæmia.

SIMON (Z).

**Heyer: Starvation Bone Disease in Munich** (Hungerknochenerkrankungen in München). *München med. Wchnschr.*, 1920, lxvii, 98.

In 9 cases this "osteomalacia of war" developed with pain in the back and extremities, a tired feeling, and difficulty in walking. In several cases the body became shorter. The rapid development of the illness is characteristic. Scoliosis, changes in the contour of the pelvis, and spontaneous fractures occur. The blood picture shows a normal red cell count, decreased hæmoglobin, and leukopænia. The X-ray picture shows the bone structure indistinct and the cortex thinner than normal.

Therapeutically cod-liver oil containing phosphorus has been of value in addition to an increase in the diet. The etiology of the condition is not clear.

JLOSE (Z).

**Forgue, E., and Chauvin, E.: Tuberculosis of Ovarian Cysts** (La tuberculose des kystes de l'ovaire). *Rev. de chir.*, Par., 1919, lvii, 881.

The first case of tuberculosis of an ovarian cyst was reported by Spencer Wells in 1863. In the literature since that time only 35 authentic cases

are to be found. Short clinical histories of these are given in this article.

The author's case was that of a woman 25 years of age who entered the hospital with a history of abdominal trouble, irregular menstruation, etc. Examination disclosed the presence of a round soft mass in the region of the pouch of Douglas which extended to the umbilicus. A diagnosis of adnexitis with cystic formation was made.

At operation an ovarian cyst the size of an orange was found. The right tube was matted with the intestines and formed a pyosalpinx the size of an egg which was full of greenish caseous pus. Both tubes and the cyst were strongly adherent to the bladder and neighboring organs. A subtotal hysterectomy was done and was followed by normal recovery.

Histologic examination of the mass showed a massive genital tuberculosis involving the uterus, the tubes, and the ovarian cyst. The primary site of the tuberculosis was the tube. The localization of the lesions in the vicinity of the tubal orifices demonstrated that the uterus was the next portion invaded. The ovarian cyst appeared to have been infected by the lymphatic route as there was a very definite lymphangitis of its fibrous layer.

In the majority of the cases reported in the literature the patients were married women. Only 7 were young girls. Pregnancy does not appear to be a predisposing factor as only 4 of the patients had borne children. The condition may involve either ovary. The conclusions drawn from the histories reviewed are as follows:

1. Tuberculosis of ovarian cysts may occur in any one of three forms: (1) in tubo-ovarian cysts with a common cavity; (2) as an external superficial condition which usually is associated with peritoneal tuberculosis; and (3) as a deep or cavitory tuberculosis.

2. As a rule tuberculosis of an ovarian cyst is associated with other tuberculous lesions which usually are situated in the genital tract.

3. The tubercle bacilli are rarely found in the lesions of cystic tuberculosis.

4. The diagnosis of tuberculosis may be made from a cytological examination of the fluid contained in the tuberculous cyst.

In the majority of cases the infection has spread from some distant focus. Remote foci may infect an ovarian cyst by the blood stream; neighboring regions may reach it by the lymphatics; and neighboring infected organs may infect it by contact.

W. A. BRENNAN.

**Fraser, J.: Hæmangioma Group of Endothelioblastomata.** *Brit. J. Surg.*, 1920, vii, 335.

The author defines endothelioblastomata as tumors of mesenchymal origin, the cells of which tend to differentiate into flat endothelial cells like those lining the interior of blood and lymph vessels and the inner surface of certain cavities and spaces such as the arachnoid and subdural spaces. The

hæmangio-endothelioblastomata, with which this article deals, are derived from the endothelial cells lining the blood vessels.

There is much confusion as to the terminology and classification of hæmangioma. The term "naevus," which is frequently improperly applied to this group of tumors, should be used only to designate pigmented tumors which are classified as melanomata. The term "hæmangioma" should be limited to tumors in which there is a new formation of vessels or a proliferation of vessel walls. Aneurisms and varicose veins are thus excluded.

The older classification of hæmangioma as capillary, venous, and arterial is no longer tenable if the author's definition of the term is correct. Hæmangioma arise from the endothelium which lines the vessel wall and it is therefore more reasonable to base their classification upon their variety of histologic structure and especially on their density. The most suggestive classification would be one which divides them into compact, capillary, and cavernous types.

Hæmangioma are congenital in origin. The first vessels which appear in the embryo are found in the mesoderm and subsequently develop in its derivatives in all parts of the animal body. In the author's opinion hæmangioma are developed from "rests" of this embryonic tissue. The small multiple angioma which appear after middle age, the so-called "de Morgan spots," may be of similar origin or originate from the endothelium of fully developed capillaries as a result of degenerative changes in the capillary wall and the escape of endothelial cells beyond the confines of the capillary lumen.

With regard to its histologic structure Fraser states that the endothelial cell is not highly differentiated morphologically. In this respect it differs from the other more characteristic cells. Individually it is a large flat cell with an oval nucleus surrounded by a moderate amount of delicate cytoplasm.

During the development of the tumor the endothelial cells proliferate and tend to arrange themselves in the form of blood vessels as under normal conditions. The most simple form of hæmangioma, therefore, consists of a collection of embryonic blood vessels. The endothelial cells which form the wall are relatively thick, thus differing from those lining fully developed capillaries. Many of these cells show active division and numerous mitotic figures. The connective-tissue stroma, normally very small in amount, may be so abundant that the tumor appears to be more or less scirrhous. The lumen of the vessel is usually empty, but occasionally may contain a few immature or degenerate corpuscular elements.

Active proliferation of the endothelial cells is constantly taking place. In the accumulation of several endothelial cells which have proliferated from the walls of an existing vessel a vacuole makes its appearance and its enlargement establishes the lumen of a future vessel. Further extension of the



tumor takes place by infiltration invading lobules of fat tissue, nerves and muscle fibers.

The lumina of the cells do not communicate with the general blood stream except under certain conditions. The blood supply comes from small arteries, capillaries, and veins circulating within the tumor.

After the early stage described the further evolution of the tumor may proceed in any one of four directions: (1) the growth may become arrested and spontaneous cure may result by a process of fibrosis; (2) while retaining the characteristics of a capillary hæmangioma the tumor may continue to grow by infiltrating the surrounding parts; (3) the original capillary type of hæmangioma may become converted into the cavernous type; (4) the original capillary type of tumor may become converted into what is termed the "compact" type. The strong persistent tendency toward spontaneous cure depends upon a deficient and diminishing blood supply. The infiltration of the tumor may be very destructive and extensive and in some cases resemble metastasis. Nerve tissue particularly seems to have very little resistance to the infiltration.

In the development of the cavernous type of hæmangioma the embryonic capillary tissue develops a connection with the circulation. The pressure of the circulating blood causes distention of the embryonic vessels and a thinning of the endothelial lining. A tumor in which this change has become general is unusual as in almost every instance the cavernous type is associated with the capillary type.

The compact type of hæmangioma develops when the endothelial cells lining a tumor of the capillary type proliferate actively. No explanation can be offered for this proliferation. Instead of forming vessels the multiplying cells collect in rows, masses, whorls, and groups. Generally this proliferation is perivascular in type, but occasionally endovascular. The compact variety of tumor is definitely localized and infiltration is exceptional. A definite capsule of fibrous tissue with septa extending inward gives the tumor a lobular form. Some pigment may be formed by the degeneration of blood corpuscles retained between the endothelial cells. If this pigment is present in large amounts, it makes the growth yellowish and may lead to a mistaken diagnosis of xanthoma.

F. M. ALLEN.

**Saul, E.: Investigations Regarding the Etiology and Biology of Tumors; Condyloma Acuminatum, Verruca Vulgaris, Cholesteatoma** (Untersuchungen zur Aetiologie und Biologie der Tumoren; Condyloma Acuminatum, Verruca Vulgaris, Cholesteatoma). *Zentralbl. f. Bakteriol.*, 1920, lxxxiv, 20.

The hyperplasia in which tumor rests have their origin begins in the "tumor mother cell." When irritated, this cell continues to grow abnormally even long after the irritation has been removed. The toxins produced by agencies causing inflamma-

tion may produce either an inflammation or a tumor, according to the circumstances of the particular case.

Saul investigated the etiology of condyloma acuminatum, verruca vulgaris, and cholesteatoma. The first is a fibro-epithelioma; the second, an epithelioma. In the smears he found streptococci which produce inflammation as well as tumor irritation. His findings are corroborated by the experiments of others.

In the development of the cholesteatoma chronic purulent otitis media undoubtedly plays an important part. Predisposition, however, is also necessary. The true cholesteatoma is due to aberrant organisms the growth of which is stimulated by the metabolic toxins of the host. The fundamental cause of the plexus-cholesteatoma of the horse is also a streptococcal infection which leads to inflammation of the vessels, cholesterol deposits, and thrombosis.

KLEINSCHMIDT (Z).

**Moore, W. H., and Wander, W. G.; Camphor-Oil Tumors.** *Arch. Dermat. & Syph.*, 1920, n.s.i., 304.

The authors report 6 cases of camphor-oil tumors to show the danger of using camphor oil indiscriminately in operating rooms and the treatment of certain severe illnesses. The duration of the tumors in these cases varied from two weeks to a year and a half. In most instances the patient's attention was first attracted to the condition by inflammatory activity. In all of the cases the tumors developed on the arms and in some instances also on the thighs. The general clinical picture was as follows:

After the injection of camphor oil for some illness deep lumps appeared on the arms or on the arms and thighs. If not inflamed, these had a doughy or concrete-like infiltration. As a rule they were lobulated, linear in outline, and limited by definite sharp angles. Their size varied from that of a walnut to that of an orange, according to the amount of oil which had been injected and the patient's reaction. Bead-like and smaller infiltrations of the same character could be traced toward the axilla and around the periphery. In some cases the skin surface was elevated or discolored, while in others palpation was the only method by which the lumps could be detected. The tumors were always deep in the connective tissue or muscle. In some cases they were tender and painful while in others tenderness and pain were absent. When the tumors were inflamed the process was of long duration and the color of the skin varied from red to deep purple, depending on the degree of the inflammation. The local temperature of a tumor was higher than that of the surrounding skin. Necrosis did not occur in any case.

The histologic examination revealed what was at first believed to be a fibroma honeycombed with holes distributed irregularly, the largest of which were 3 mm. in diameter. In some areas the tumor had the appearance of fatty tissue. The injected



oil was deposited in the connective tissue and lymph spaces where it remained as an inert foreign body. The localized pressure stimulated a low grade of temporary inflammation with the gradual formation of new connective and fibrous tissue. The epidermis remained unchanged until involved by the inflammation. The elastic tissue under the epidermis was unaltered. In the early stages the lesion might be considered a true fibroma but after inflammatory changes have taken place it has the characteristics of a granuloma. The oil was found to be retained in the form of large and small drops. The capsule was made up of from 2 to 5 concentric rings of fibrous connective tissue. The old and newly-formed blood vessels and the walls of the capillaries were greatly thickened. In the first case reported an inflammatory tumor was diagnosed on histologic examination as due to tuberculosis because of its granulomatous character and many giant cells.

In the treatment the best results have been obtained by rest and the elevation of the affected part to overcome the inflammation. These measures should be continued over long periods of time until the fibrosis is as complete as possible. Excision would be the ideal treatment if the lesion were not so extensive. Heat and massage are contraindicated as they increase the inflammatory condition and may cause its dissemination into larger areas. Roentgen-ray treatment is of doubtful value and may be more or less dangerous because of its possible effect on the already disturbed circulatory balance of the tumor mass.

I. W. BACH.

**McCoy, J. N.:** *The Solar Keratoses and Cutaneous Cancer.* *Arch. Dermat. & Syph.*, 1920, n.s.i, 173.

The author states that 37.8 per cent of all cancers are on the exposed skin. Keratoses precede all cutaneous cancers except those situated at the mucocutaneous juncture of the lower lip. The latter are due to other forms of trauma, this region being remarkably free from keratotic formation. Keratoses are due to the chemical action on the skin of the violet and ultra-violet rays.

Pigmentation of the skin is evidently a factor preventing the formation of keratoses as keratoses and carcinoma are infrequent in dark skinned people. Sixty-two per cent of the author's patients were blondes, 7 per cent were dark skinned, and 31 per cent were persons with dark hair but only slightly pigmented skin.

White clay soil, water, white or gray stone roads enhance the effect of the rays by reflection, and it has been noted that where such factors predominate keratoses and cancer are more frequent than in other regions.

K. L. VEHE.

**Bryant, F.:** *Malignancy and Radiation; A Study of the Relation of the Structure of Cancer Tissue to Radiation.* *Boston M. & S. J.*, 1920, clxxxii, 263.

In spite of all the time, effort, and money expended in cancer research, exact scientific knowledge of

malignancy is still very incomplete. Much has been learned, however, regarding the history of the disease and the factors controlling it. It is known that cancer has afflicted humanity from the earliest times and is therefore not a product of civilization. It is known also that it is not hereditary, infectious, or communicable. In its incipient stage it is a local or regional disease and amenable to surgical cure. It is generally believed to follow chronic stimulative irritation, constant or intermittent, traumatic or chemical, perceptible or imperceptible. According to Mallory "the exact manner in which cancer arises is not definitely known, but it seems to be due not to direct stimulation of the epithelium but to injury done to connective tissue and the blood vessels, as a result of which excessive regenerative efforts on the part of the epithelium are called forth."

The age period at which cancer is most apt to develop is after the forty-fifth year. In each anatomical locality it differs in its rapidity of growth, tendency to form metastases, and response to treatment.

Every higher organism has its origin in a single cell. This cell proliferates by division and forms the epiblast, mesoblast, and hypoblast. These in turn multiply and differentiate into fifteen different types of cells and the latter may in time develop into tumors. According to Swift "not the highest, but the lowest, organisms are most prolific."

In the treatment of cancer radiation and surgery give the best results, radiation being perhaps the better of the two. The mode of action of radiation is not yet well established but it is believed that it acts first upon the newly formed cells, at the same time exerting a destructive influence upon the fresh sources of blood supply, and that in response to nature's call for repair a proliferation of connective tissue results. If the intensity of the radiation is insufficient, the cell may be rendered dormant only temporarily, while if it is too intense the surrounding normal tissue may be broken down and nature's repair and resistant properties entirely destroyed.

It has become more and more apparent that the successful use of radium in the treatment of cancer requires careful consideration of each type of the disease. Some tumors require much more radiation for their destruction than others. Chondromata and tumors of osteogenetic origin react slowly. Sarcomatous growths react much more quickly than carcinomata. Basal-cell epithelioma of the skin is the most easily destroyed, while epidermoid carcinoma of the tongue is the most hopeless. Next in resistance to treatment comes carcinoma of the rectum.

The condition of the tissues surrounding the tumor mass must also be carefully considered. This is influenced by age, vitality, habits, and disease. For example, persons with tuberculosis or syphilis are poor subjects for radiation, and the older the tumor the less apt it is to yield to radiation. An infection of the growth is a contra-indication for radiation. Before and after operation radiation is always to be



advised. Before operation it is of value to render the growth less malignant, to cover all possible routes of metastasis, and to render uninvolved lymphatics immune to invasion by bringing about a sclerosis. After operation it is indicated to destroy any scattered cells which may have escaped previous treatment. In inoperable cases radiation is recommended to prolong life, lessen pain, and check hemorrhage and discharges.

As to the comparative values of radium and the roentgen ray it is safe to state that radium is admirably fitted and far superior to the roentgen ray for the treatment of growths in cavities or areas in which it can be used in needle form or emanation tubes, while the roentgen ray is better adapted for use on large surface areas, including the mass or the scar of the wound, the metastases, and the lymphatic distribution.

LOUIS HANDELMAN.

**Smith, J. M.: The Etiology, Treatment, and Results of Cholesteatoma.** *N. York M. J.*, 1920, cxi, 495.

The consensus of opinion is that cholesteatoma is due to an overproduction of epithelial tissue, the foothold being obtained by direct extension into the middle ear through a break in the tympanic and mucous membranes, or a metaplasia of the tissues in the tympanic cavity.

Two types are recognized, the encapsulated and the non-encapsulated. In the encapsulated type a pearl-like sac is contained in the cavity which is lined by a single layer of short columnar or cubical epithelium resting on a thin fibrovascular endosteum. The sac itself consists of a somewhat thickened fibrovascular sheath containing a few plasma cells and lined by stratified epithelium. Eleidin granules are found in this layer. In the author's opinion this is a true metaplasia.

In the non-encapsulated type a granuloma is embedded in loose lymphocytes, leucocytes, and myelocytes in all stages of fatty and granular degeneration, blood, pus and bacteria of all kinds, spicules of bone, and squamous cells in loose or laminated pearls. Cases are reported in which there was no evidence of perforation of the ear drum. Probably in such instances the perforation closed after the process had begun.

It is not always possible to make a diagnosis. Some of the cheesy mass may be removed directly from the external auditory canal or tympanum for examination. Smears made from a chronic discharging ear which show at each examination dead epithelium and cholesterol crystals may suggest the condition. Experience teaches that all cholesteatomata are dangerous even though sterile. If uninterrupted, the mass continues to enlarge and destroys not only the soft tissues, but the bony tissues as well. Therefore the danger is due to a secondary intracranial infection.

In the treatment the field should be rendered smooth and as free as possible from bony recesses. Radical operation is the only method of

procedure. By operation the auditory canal is enlarged and the middle ear, the antrum, and the mastoid are converted into one continuous cavity. A cure results if in the after-treatment the formation of granulation tissue is prevented and the cavity dermatizes.

The author considers the prognosis good, especially in cases in which the patient is operated upon in time. He believes that in a large majority of cases failure is due to faulty technique at the time of operation or in the after-treatment.

I. W. BACH.

## BLOOD

**Otani, M.: A New Method of Phagocytosis Test with the Blood Plasma; A Specific Immunological Reaction.** *Med. Record*, 1920, xcvi, 439.

The technique of the author's method of testing phagocytosis is much more simple than that of Wright's opsonin test. The method is based on the fact that citrated or oxalated blood plasma of patients infected by certain species of pathogenic micro-organisms has a remarkably augmented phagocytal power against that particular species of micro-organism.

Citrated blood is prepared by mixing 0.1 ccm. of a 2 per cent solution of neutral sodium citrate and 0.2 ccm. of fresh blood. Plasma obtained by centrifugalizing citrated blood can be kept in good condition in a refrigerator for two weeks. In testing human blood, the citrated blood and its leucocytes can generally be employed directly as such, but in the test with the plasma against tubercle bacilli or staphylococci, the leucocytes must be washed because of the difficulty of obtaining normal blood. The blood is collected from the finger tip in 7 ccm. of a 0.7 per cent sodium citrate solution and is centrifugalized, the supernatant fluid being removed. In preparing the bacillary suspension for the test a strongly virulent strain should be employed. With the typhoid group of bacilli, bacillus dysenteriae, and bacillus coli, use is made of eighteen-hour agar cultures of the strength 1.0 mgm. of the bacilli suspended in every 1.0 ccm. of a 1.5 per cent sodium citrate solution prepared with physiological salt solution. The article contains a detailed description of the preparation of the suspension of tubercle bacilli.

For the testing of human blood or horse blood the citrated blood method is most convenient, two volumes of the citrated blood to be tested and one volume of bacillary suspension being used. The citrated blood should be mixed with the bacillary emulsion within at least two hours after its collection. The normal leucocytes are necessary for a control.

The blood-plasma method must be employed in cases in which there is leucopenia, as in typhoid fever, and cases in which the test is made after longer intervals of time. It is therefore of value especially for the laboratory test. It can be employed

also in testing rabbit or guinea-pig blood for which the citrated-blood method is not suitable. When a genuine normal blood is obtainable and when the blood of a typhoid or dysenteric case is to be tested, the quantities used are: blood plasma to be tested, 1 volume; citrated normal blood, 2 volumes; bacillary suspension, 1 volume. When it is impossible to obtain a genuine normal blood and the blood of a tuberculous patient is to be tested the quantities are: blood plasma to be tested, 1 volume; washed leucocytes, 1 volume; bacillary suspension, 1 volume. In the control test for each of these two systems the blood plasma to be tested is replaced by the same quantity of a 0.7 per cent sodium citrate solution.

Directions are given for the preparation of microscopic slides, including the smearing, fixation, and staining of the tubercle bacillus, dysentery bacillus, and the bacilli of the typhoid group. The method of calculating and interpreting the results is also described.

W. H. NADLER.

**Emmel, V. E., Levinson, S. A., and Fisch, M. E.: Coagulation in Embryonic Blood. *J. Exper. Med.*, 1920, xxxi, 177.**

In the course of an experimental study of the origin of non-nucleated erythrocytes Emmel previously observed that the coagulation time of embryonic blood is slower than that of adult blood and that there are other striking differences. In this article are presented the findings of a more extended study undertaken to ascertain: (1) the facts regarding the coagulation time of embryonic blood; (2) the extent to which the factors essential to coagulation are comparable in the embryo and adult; and (3) the conditions in embryonic blood which might possibly explain certain types of abnormal coagulation occurring in postnatal life.

The study was confined largely to pig embryos 100 to 270 mm. in length. These were obtained from the uterus under favorable conditions within a short interval after the sow was killed. Use was made only of embryos in apparently normal condition in which the hearts were still beating or would respond to stimulation. This was a point of considerable importance since it was found that in the blood of embryos in which the hearts were not beating the coagulation time was materially reduced.

The average coagulation time of the blood of the embryos was found to be about twenty-three minutes, from six to eight times greater than that of adult blood.

The first evidence of coagulation in the embryonic blood consisted in the appearance of small masses of fibrin which almost invariably were deposited at the side of the test-tube. The resulting coagulum was as a rule a sliding clot, never attaining any marked degree of density or firmness.

In the attempt to determine the cause of this greater coagulation time of embryonic blood it was found that the blood platelets varied numerically

from 415,000 to 800,000 per cubic centimeter, a content not differing greatly from that of the adult blood in which the number was about 588,000, varying from 544,000 to 932,000.

The addition to the embryonic blood of platelet material obtained from adult pig blood reduced the coagulation time to an average of eight and four-tenths minutes, a decrease of 75 per cent, while the addition of 2 drops of 0.5 per cent calcium chloride reduced it to an average of ten and three-tenths minutes, a reduction of over 50 per cent.

Following the addition of tissue extract the coagulation time was reduced to an average of three and seven-tenths minutes when it was approximately equal to that of adult blood. The clot resulting was much firmer than that obtained in either the normal coagulation or after the addition of calcium chloride.

Chemical analysis demonstrated an excess of calcium in embryonic blood as compared with adult blood in the proportion of 7:5.

From the various determinations it was evident that the calcium in embryonic blood must be present in some combined form. This conclusion was supported by experiments in which barium and magnesium brought about a reduction in the coagulation time of non-oxalated embryonic blood but not in oxalated blood, a fact which indicated that in the former case free calcium ions were liberated. In oxalated blood it was found also that under certain conditions coagulation could be brought about by the addition of tissue extract.

That the fibrinogen content was of no importance in the coagulation time was shown by the fact that although the maximum amount of fibrin obtained by defibrination of embryonic blood was only about 12 per cent of that obtained from adult blood, the coagulation time of embryonic blood upon the addition of tissue extract became equivalent to that of adult blood.

The presence of bile was also demonstrated in the circulating blood of the embryos studied and it was found also that the addition of bile to adult blood produced conditions essentially identical with those of embryonic blood. Therefore as no significant differences could be demonstrated between the blood of the embryo and adult animal other than the presence of bile in the former, the conclusion seems justified that, in pig embryos from 100 to 270 mm. long, bile is the primary factor accounting for the greater coagulation time of the embryonic blood. A condition in the embryonic blood comparable in some respects to that of icterus was also indicated.

The results of the experiments with calcium were apparently due to the introduction of the calcium ions in excess of the amount which enters into chemical combination with the bile present. When tissue extract was used it appeared that the free calcium ions essential for the initiation of coagulation were liberated by some interaction with the constituents of the bile.



From these findings it seems evident that the normal coagulation of embryonic blood involves a process which is comparable to that obtained after the addition of tissue extract or cephalin but on a smaller scale. In the embryonic blood *in vitro* a certain amount of tissue substance (cephalin?) was slowly set free in the plasma through the gradual disintegration of cellular elements, the bile was neutralized, and a sufficient amount of calcium was ultimately liberated to bring about coagulation.

G. E. BEILBY.

**Miller, A. H.: Blood Pressure in Operative Surgery.** *J. Am. M. Ass.*, 1920, lxxiv, 514.

Blood pressure is an important factor in surgery and therefore should always be determined before operation.

The normal ratio between the pulse pressure and diastolic pressure is between 40 and 60 per cent. If the ratio lies between 25 and 75 per cent the case is probably operable; if it is outside these limits the case is probably inoperable.

During operation blood-pressure tests furnish a valuable index as to surgical shock, hæmorrhage, and the anæsthetic dosage. The pressure should be determined by the anæsthetist every ten minutes. This can be done by means of long tubing attached to the stethoscope which, with the sphygmomanometer, should be fastened in place.

Changes are produced by excitement, obstruction to respiration, the use of too much anæsthetic, changes in the patient's position, variations in the temperature of the operating room, hæmorrhage, and operative manipulation. A low temperature in the operating room, a large incision, and exposure of the viscera will cause a considerable fall in the blood pressure.

When the patient is in the dorsal position the systolic pressure does not increase or diminish. When he is placed in the lithotomy position, it increases. The combined lithotomy and Trendelenburg position greatly increases the systolic pressure, while the Trendelenburg position and the Fowler position both decrease it, the latter considerably. The Fowler position should not be used after or during operation unless the patient's condition is satisfactory.

Cyanosis raises the systolic pressure, excitement raises both the systolic and the diastolic pressure, and profound general anæsthesia may lower both of them. Spinal anæsthesia causes a distinct drop which may prove dangerous.

Surgical shock is indicated by an increasing pulse rate with a falling blood pressure. It has occurred when the pulse rate was over 120 and the diastolic pressure under 80.

The sphygmomanometer should be used not only in selected cases, but as a routine measure. By means of it the anæsthetist will become accustomed to the normal variations in the blood pressure during operations and more easily detect signs of danger.

W. H. HOBART.

## BLOOD AND LYMPH VESSELS

**O'Hare, J. P.: Vascular Reactions in Vascular Hypertension.** *Am. J. M. Sc.*, 1920, cliv, 369.

The observation that 1/100 gr. of nitroglycerin administered in cases of vascular hypertension causes a startling fall in blood pressure and a condition bordering on collapse, a reaction apparently counteracted by the injection of adrenalin, stimulated the author to a study of vascular reactions. From his determinations of the variations in pressure produced by nitroglycerin, rest, excitement, exercise, and adrenalin, he offers the following conclusions:

1. The vasomotor system in vascular hypertension is extremely labile and sensitive.
2. Mental and physical rest cause a marked fall in pressure.
3. Excitation causes a more marked abrupt rise in pressure.
4. Exercise usually results in a rise similar to that following excitation.
5. Nitroglycerin produces practically no fall in pressure and following its absorption there is often a primary rise.
6. The vessels are especially sensitive to the intramuscular injection of adrenalin, a marked rise in pressure taking place immediately after such an injection.

The use of adrenalin in cases of vascular hypertension, therefore, appears to be not without danger.

W. H. NADLER.

## GENERAL BACTERIAL INFECTIONS

**Vernoni, G.: Tetanus Following Serum Treatment** (Sul tetano postserico). *Chir. d. organi di movimento*, 1919, iii, 153.

Following inadequate prophylactic treatment with antitetanus serum the period of incubation of the tetanus may be simply prolonged and the tetanus may have all the clinical characteristics of ordinary tetanus in patients who have not been given prophylactic treatment. In other cases a short incubation period is followed by sudden onset of the disease and the symptoms differ from those of ordinary tetanus. In still other cases the period of incubation is prolonged and the tetanus is not very severe.

In Vernoni's opinion repeated intravenous injections of heterogeneous serum cause the development of anaphylaxis and the hyperpyrexia is a form of anaphylactic crisis provoked by autogenous antigens, viz., muscle metaproteins. In some cases patients who are believed to be recovering because of the disappearance of the symptoms of tetanus suddenly become worse and die within a few hours with symptoms of a severe intoxication and a very high fever. In such instances it is most probable that the efforts of the body to overcome the toxins fail and the fatal outcome is due to a general intoxication.



The treatment of tetanus following serum treatment does not differ much from that of ordinary tetanus. Vernoni prefers intraspinal injections of between 40 and 50 ccm. of antitetanus serum. The injections should be made not only into the dural sac but also into the peridural space and should be preceded by the evacuation of the maximum quantity of cerebrospinal fluid. A second intraspinal injection may be made not later than between twelve and twenty-four hours after the first injection. In addition, intramuscular injections should be given. Intravenous injections, however, are superfluous. Repeated intestinal lavage is another important factor in the treatment.

W. A. BRENNAN.

**Razzaboni, G.: An Anatomical and Clinical Study of the Action of Certain Organs and Systems in Gas Gangrene** (Studio anatomico-clinico sul comportamento di taluni organi e sistemi nella gangrena gassosa). *Arch. ital. di chir.*, 1919, i, 322.

Gas-bacillus infection of wounds, so common during the recent war, has been studied very extensively, both clinically and experimentally, and practically all phases of the subject are well understood except the treatment. The etiology, diagnosis, symptoms, and local pathology have been described minutely, but the histologic findings in areas remote from the site of the local lesion and the behavior of certain organs and systems have been neglected although they often determine the character of the outcome. Even in the thorough monographs of Charlier, Weinberg, Legue, and Aperlo these subjects are dwelt upon very lightly.

The author describes the general symptoms of gas gangrene in detail. At the outset the condition is characterized by restlessness, anxiety, insomnia, and delirium. The skin is dry and pale and often has a subicteric tint which approaches a muddy hue with subcyanosis about the nasolabial folds and the orbits. As a rule the temperature is high. The central nervous system, especially the brain, is in a state of hyperactivity. The heart is dilated. The heart tones are rapid, weak, and muffled. Other characteristics of the heart action are a reduplicated second tone, galloping rhythm, and diffuse fibrillation. The radial pulse is thready and rapid, varying between 130 and 150. Cyanosis of the finger tips is common. Respiration is rapid. The physical examination reveals the signs of hypostasis. The tongue is dry and coated. Vomiting often occurs and diarrhoea is a constant symptom. The liver and spleen are slightly enlarged. The urine is diminished in amount and contains albumin and biliary pigment.

The article gives complete autopsy reports. The local lesions of the condition consist of cedematous diffuse infiltration of the subcutaneous, subfascial, and loose intermuscular tissues associated with the presence of a brownish-gray fluid exudate and foetid gas. Even at a distance from the local lesion

the muscles look as if they had been cooked or partially digested. The heart is pale, flaccid, and dilated, especially the auricles. Microscopically there is a separation of the muscle fibers, a segmentation myocarditis with regressive changes in the endocardium and pericardium. The lungs present hypostatic congestion with foci of bronchopneumonia. Histologically, hyperæmia and interalveolar hæmorrhage are found. The thyroid gland is negative. The kidneys, stomach, and bowels are hyperæmic. The liver is enlarged and hyperæmic and on microscopic section presents a diffuse fatty degeneration with multiple foci of inflammatory infiltration. The changes in the spleen are characterized by vasodilation and hyperplasia of the malpighian corpuscles. The adrenals are intensely hyperæmic and often hæmorrhagic. The retroperitoneal nodes are hyperplastic. I. F. VOLINI.

#### EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

**Reid, M. R.: The Effect of Arteriovenous Fistula upon the Heart and Blood Vessels; An Experimental and Clinical Study.** *Bull. Johns Hopkins Hosp.*, 1920, xxxi, 43.

Since the fall of 1914 the author has been making some experimental and clinical observations upon the blood vessels and heart with William S. Halsted. The work was begun by studying the effect of partially occluding aluminum bands upon the larger arteries of dogs and was stimulated by clinical observations upon subclavian ribs which, when they partially occluded the subclavian artery, sometimes gave rise to the formation of an aneurism just distal to the rib. Thus begun, the author's work has led into various other lines. One of these was the experimental study of the effect of arteriovenous fistula on the vascular system.

Halsted was familiar with the fact that an arteriovenous fistula materially altered the size of the artery proximal and distal to the point of fistula, and had seen clinical cases in which the heart was markedly dilated and hypertrophied. On the assumption that the same cause might explain the clinical observation that an artery dilates distally to a partial occlusion of its lumen and proximally to an arteriovenous fistula, Reid produced fistulae between the arteries and veins of dogs.

At first the fistulae were made between the femoral artery and vein, but these usually did not remain patent for longer than a few months. When the internal carotid artery and jugular vein were used there was no difficulty in keeping the fistula permanently patent.

Reid reports the results of these experiments on dogs and gives also the histories of 14 cases of arteriovenous fistula admitted to the wards of the Johns Hopkins Hospital.

The author's experimental and clinical study convinced him that grave cardiac disturbances may result from the presence of an arteriovenous



fistula. Cardiac hypertrophy and dilatation due to this cause are scarcely mentioned in the medical literature. In 3 of the clinical cases the heart was markedly enlarged, while in 2 cases of congenital arteriovenous fistula in the neck there was no apparent abnormality of the heart, although in 1 case there was a definite proximal dilatation of the artery.

From his experiments and study Reid concludes as follows:

An arteriovenous fistula of long duration usually caused dilatation of the artery proximal to the fistula. This dilatation sometimes extended as far as the heart.

Marked cardiac disturbances sometimes resulted from an acquired arteriovenous fistula of long standing. These disturbances were hypertrophy and dilatation with eventual cardiac decompensation.

The wall of the vein involved in an arteriovenous fistula became hypertrophied. Although the vein on the proximal side of the fistula did not increase markedly in size, its wall showed a greater increase of elastic tissue than the wall of the vein distal to the fistula.

The venous blood pressure was increased in the part of the body distal to an arteriovenous fistula. When the fistula was cured the pressure returned to normal.

G. E. BEILBY.

**Smith, T.: Mycosis of the Bovine Fœtal Membranes Due to a Mould of the Genus *Mucor*.**  
*J. Exper. M.*, 1920, xxxi, 115.

An accurate knowledge of the number and variety of living organisms which may invade the uterochorionic space during pregnancy and cause localized or general disease of the chorion can be gained only by a cumulative study of the pregnant bovine uterus before the discharge of the fœtus. After expulsion, adhesion of the placenta, the loss of the pathologic fluids held between the uterine wall and the chorion, the soiling of the placenta by the bedding, or its destruction by the animal make a satisfactory investigation impossible.

The relation of the vibrio fœtus to abortion may be considered as established. Occasionally bacillus pyogenes is also present in the organs of the discharged fœtus in such numbers that tentatively it may be regarded as a primary agent.

A *mucor* closely resembling Lichtheim's *mucor rhizopodiformis* was isolated from the diseased chorion of a cow and from the lungs and digestive tract of the fœtus. No other micro-organisms were detected. The *mucor* was demonstrated in teased preparations from the fresh cotyledons as well as in sections of suitably hardened tissues. The intravenous injection of the spores into rabbits was followed by focal lesions. The condition of the amniotic fluid and the contents of the rumen of the fœtus seemed to the author to justify the inference that premature expulsion was impending.

G. E. BEILBY.

## ROENTGENOLOGY AND RADIUM THERAPY

**Holland, C. T.: An Address on War Lessons for Radiology.** *British M. J.*, 1920, i, 353.

In the first part of this article the author deals with the status of radiology in the British Army from the beginning of the war in 1914 and the tardy recognition by the army authorities of the claims of radiology and X-ray workers. Recognition was finally evidenced by the appointment in 1918 of expert radiologists as advisers to the various army commands, and by the grading of the R. A. M. C. officers with regard to their X-ray knowledge.

In discussing the effects of the war on X-ray apparatus and the invention of new instruments it is stated that the only outstanding advance was the American standard mobile transformer unit with its radiator type of Coolidge tube. With this outfit all the work required at casualty clearing stations, advance hospitals, and most base hospitals could be done.

The author cites the following classes of cases in which he believes the science and art of radiography were advanced: (1) diaphragmatic hernia, frequently seen following wounds of the diaphragm; (2) gas gangrene; (3) tropical abscess of the liver and (4) keloid.

No real advance was made in localization work, although valuable experience was gained both in this and in examinations to determine the presence of bone injuries.

Attention is called to the fact that during the war the importance and scope of radiology were impressed not only upon physicians and surgeons but also upon the general public, both by the enormous number of wounded who were examined and treated by the X-ray and the many persons who became interested and assisted in this science in England and other countries. The result has been a great increase in X-ray work.

The author adds a word of warning to lay assistants who, having a smattering of X-ray knowledge, set themselves up as radiographers, and also to medical men who have little general knowledge of radiography and its interpretation with regard to the kidneys, thorax, abdomen and its contents, bone disease, and treatment. He strongly urges medical men who contemplate doing X-ray work to prepare themselves with a course in radiology.

In conclusion, the importance of efficient X-ray work for success in war surgery is re-emphasized. This work should be recognized by the army as calling for expert training. The teaching of radiology to officers, the training of nurses and orderlies as assistants, and the standardization of X-ray equipment should be organized and kept up to date by a permanent staff at the War Office. Postgraduate work in this subject should be offered and those who wish to become experts should be required to obtain special training leading to a diploma. Undergraduates also should be instructed and examined in X-ray work.

J. E. MCCORVIE.



**Vilvandré, G. E.: Observations on the X-Ray Treatment of Neoplasms.** *Brit. M. J.*, 1920, i, 215.

Vilvandré states that when we are able to diagnose malignant disease early in all cases, X-ray therapy will be limited to cases in which mechanical or physiological conditions prevent operation. Until then we are obliged to use it for many tumors the size and position of which forbid the use of the knife. The author has had the best results in sarcomata, especially in the slow-growing varieties. Several patients who on clinical examination were believed to have a sarcoma and who were given X-ray therapy alone were apparently well five years after the diagnosis was made.

In carcinomata (except in rodent ulcer) the results are not so striking and secondary glandular involvement is more apt to occur. Vilvandré urges the routine radiation of scars after the removal of squamous-cell carcinoma of the lip and other such tumors. He believes the reaction of a tumor to the ray depends not on its vascularity but on the amount of fibrous tissue in the stroma, the greater the amount of fibrous tissue the slower the growth and the better the response to treatment. From the standpoint of therapeusis the X-rays may be divided into two classes, namely, those that stimulate growth and those that inhibit it. As an illustration of the effect of the former is cited the development of cancer upon a lupus vulgaris after frequently repeated small doses of the rays. Attention is called to the similarity in action of arsenic and X-rays. Both produce erythema, pigmentation, hyperkeratosis, and neuritis, and after prolonged treatment both may produce carcinoma. The fact that the prolonged administration of arsenic leads to nerve degeneration and hyperkeratosis upon which epitheliomata may develop, suggests that possibly some forms of carcinoma may be due to lack of nerve control of the cells following primary nerve degeneration.

In the treatment of tumors of the thorax accurate localization is essential and markings should be made on the chest wall. Cases of neoplasms of the lung, while not curable, may be much relieved of pain, cyanosis, and cough.

The essentials in the treatment of neoplasms are: (1) careful protection of the skin; (2) prolonged treatment; (3) accurate dosage and localization; and (4) heavier doses of harder rays through thicker filters than have been used heretofore.

J. H. P. GAUSS.

**Muehlmann, E.: The Treatment of Tuberculosis with the X-Rays** (*Die Behandlung der Tuberkulose mit Röntgenstrahlen*). *Therap. Halbmonatsschr.*, 1920, xxxiv, 35.

The author reports the indications for the X-ray treatment of tuberculosis, the technique, and the results. The action of the rays depends upon the stimulation of connective-tissue growth and therefore the forms of tuberculosis with abundant granu-

lation tissue are benefited most, whereas old caseated foci are not benefited at all. The X-ray does not act upon the tubercle bacilli but by removing their nourishment causes them to lie dormant in the connective-tissue wall.

The technique of the roentgen-ray treatment of tuberculosis is the same as for other conditions. Weak and feverish patients must first be strengthened and freed from fever. Amyloid and contracted kidney are contra-indications. In the treatment of tuberculosis of the glands of the neck, the larynx must be protected and if possible also the salivary glands. Tuberculosis of the lymph glands, tendon sheaths, bones, hands, feet, ribs, sternum, and scapula may be entirely cured with the X-ray, especially if the foci are still closed. If caseated foci do not improve they should be attacked surgically. Postoperative raying decreases the danger of recurrence. Fistulae should be cleaned out and all caseated material removed. Caseations should be punctured, injected with iodoform, and rayed.

Tuberculosis cutis verrucosa may be entirely cured by the X-ray. Lupus vulgaris should be treated with the Finsen rays immediately. In cases of tuberculosis of the larger bones and joints the use of the X-ray alone rarely results in a cure. It seems to hasten recovery, however, and with improved technique the results will probably be better.

The X-ray has not been used in the treatment of tuberculosis of the uropoietic system, the genital system, or the peritoneum. In pulmonary tuberculosis only the disseminated and indurated forms are adapted to X-ray treatment as the necessary amount of granulation tissue is present in these alone.

TROMP (Z).

**Lobenhoffer, W.: The X-Ray Treatment of Cancer** (*Beiträge zur Röntgentherapie des Krebses*). *Munch. med. Wchnschr.*, 1920, lxxvii, 119.

The more extensive the employment of the X-ray in the treatment of cancer the more strictly must the indications be limited. The treatment of cancer with the X-ray has recently been attacked by many so-called X-ray therapeutists. According to their statistics the X-ray has not improved the ultimate results and has not come up to expectations.

Cancer of the uterus is more favorable for X-ray treatment than most cancers. This must be due to a peculiarity of its cells as almost all other surgical cancers are more readily reached with the X-rays. Cancers of the digestive tract—those of the pharynx, gums, and tongue—react least of all. In skin cancers the author has observed a preliminary retrogression to minute rests and frequently a sudden and rapid uncheckable growth. Slightly more favorable are the cases of cancer of the oesophagus.

To ray a breast cancer that is still considered operable is not advisable in view of the poor results. Early removal of the breast with thorough cleaning out of the axillary and other nearby glands should



precede X-ray treatment. Definite conclusions regarding the treatment of recurrences with the X-ray alone are still not possible. In the treatment of inoperable cases the X-ray is a valuable aid but cannot yet be considered a cure for cancer.

CARL. (Z)

**Martin, C. L.: Roentgen-Ray Study of the Great Vessels.** *J. Am. M. Ass.*, 1920, lxxiv, 723.

The accurate percussion of supracardiac dullness is often extremely difficult, especially in the presence of obesity. Even when an increase of the width is determined, it is no easy matter to ascertain the cause. The roentgen examination is a valuable aid in establishing the diagnosis.

The author describes the findings in a series of cases of involvement of the great vessels and illustrates his article with a number of tracings from "7-foot" plates made by the teleroentgenographic method. After briefly analyzing the component parts of the silhouette cast by the heart and great vessels, Martin discusses the various causes of an increase in the width of the shadow of the great vessels.

Lesions of the mitral valve lead to enlargement of the left auricle and pulmonary artery so that these may overlie the left border of the descending aorta and extend upward to the crest of the arch. In such cases, the supracardiac dullness is definitely increased to the left as is also the shadow seen in the roentgenogram.

Arteriosclerosis of the aorta frequently leads to a tortuosity manifested as an increased prominence of that portion of the aorta to the left of the spine just before it becomes the descending aorta. Syphilis of the aorta frequently manifests itself by a bulging out of the ascending aorta immediately above the aortic valves. Hypertension usually leads to a diffuse dilatation of the aorta. A high diaphragm in patients with large amounts of abdominal fat or intra-abdominal pathology may be responsible for an unusually wide aortic arch. Enlargement of the pulmonary artery from congenital anomalies or obstruction may cause a definite increase in the shadow. Frequently a combination of conditions produces findings which are extremely difficult to analyze. In some cases the appearance of the heart shadow gives information relative to the nature of the condition causing the change in the great vessels.

The article is summarized as follows:

In recent years there has been an ever-increasing tendency to apply the roentgenogram to the diagnosis of syphilitic aortitis. That the X-ray picture is a very valuable adjunct to the clinical findings there is no doubt, but the importance of a conservative interpretation of a widened shadow of the great vessels should be emphasized.

Arteriosclerosis, hypertension, chronic endocarditis, a high diaphragm, or a dilated pulmonary artery may give a similar picture, and it is perhaps wiser for the roentgenologist to suggest the diagnosis of

aortitis only in cases showing a localized prominence at the base of the ascending aorta.

It is the exception rather than the rule to find a single cause underlying increased supracardiac dullness. The occurrence of syphilitic aortitis, arteriosclerosis, hypertension, and a high diaphragm in the same patient is not very uncommon.

Detailed histories of a number of illustrative cases are cited.

ADOLPH HARTUNG.

**Pancoast, H. K.: Roentgen-Ray Studies of the Functional Alterations of the Diaphragm.** *N. York M. J.*, 1920, cxi, 353.

The diaphragm may be regarded as an important organ of the chest. Its function may be altered or temporarily or permanently suppressed by disease of the muscle itself or of neighboring structures. These variations may be readily detected by the roentgenoscope. Williams was one of the first to make an extensive study of the diaphragm with the roentgen ray and to note the changes associated with various pathologic conditions.

Paralysis of the phrenic nerve from any cause produces relaxation of the diaphragm, making it appear elevated and motionless. In disease of the lung causing inelasticity a decided restriction of diaphragmatic movement will be found. This is especially noticeable if the lower lobe of the lung is involved and there is much fibrosis. It occurs in tuberculosis, pneumoconiosis, abscess, and gumma. Inflammatory conditions also cause some diaphragmatic restriction, the degree depending upon the nearness of the lesion to the diaphragm as well as the extent of the process. Neoplasms of the lungs produce diaphragm restriction which depends upon their location, size, inelasticity, and pressure on the air passages.

Disease of the pleura is probably the most frequent cause of serious interferences with diaphragmatic movement. Such conditions may act by pressure, adhesions, reflexly because of pain, or by causing disease of the diaphragm muscle. Localized collections of fluid at the bases tend to fix the muscle; large general effusions cause it to become depressed and stationary. A thickened pleura and adhesions frequently produce permanent restrictions. Obstruction in the air passages from pressure or foreign bodies causes a limitation of movement in direct proportion to the amount of respiratory obstruction. The influence of myositis cannot be definitely determined as other factors usually enter into the changes observed. Reflex disturbances, principally pain, may manifest themselves by diaphragmatic restrictions. This has been noted in acute pleurisy and acute peritonitis. Diaphragmatic hernia and eventration may be readily diagnosed by the roentgen examination. Conditions in the abdomen may cause changes in the diaphragm which lead to their detection. Thus subphrenic abscesses cause more or less diaphragmatic elevation, flattening, and restriction of movement. Hepatic abscesses pointing under the diaphragm, nodular

growths in the liver, and ascites with large amounts of fluid may show diaphragm changes on roentgen examination which will aid in their discovery.

ADOLPH HARTUNG.

**McClure, C. W., and Reynolds, L.: The Interpretation of Roentgen-Ray Findings in the Diagnosis of Peptic Ulcer: Some Difficulties.** *J. Am. M. Ass.*, 1920, lxxiv, 711.

Temporary muscle spasm occasionally produces a distortion in the outline of the duodenum or stomach similar to that caused by ulcer and a persistent duodenal deformity resembling that of ulcer may be the result of some other condition such as congenital or acquired adhesions. Another difficulty in the diagnosis is the fact that the roentgenographic findings in true cases of peptic ulcer may be very atypical. Detailed reports are given to illustrate the types of cases described.

The authors' conclusions are summarized as follows:

1. Cases occur in which the presence of an ulcer is either not diagnosed at all or its presence or absence cannot be definitely determined except by exploratory operation.

2. It is necessary to interpret roentgen-ray findings in relation to the data obtained by careful and thorough clinical study.

3. In certain cases roentgen-ray findings are more confusing than helpful in the diagnosis.

It is obviously necessary for the internist to become familiar with roentgen-ray findings even though he can scarcely hope to become as adept as the expert roentgenographer. The best results are obtained therefore by the proper cooperation of the clinician and roentgenographer. Such cooperation consists of: (1) the accurate description of the roentgen-ray findings, the portrayal of the most probable conditions represented by them, and the exclusion of artefacts, on the part of the roentgenographer, and (2) the correlation of the roentgen-ray findings with the symptoms, on the part of the clinician.

ADOLPH HARTUNG.

**Alvarez, W. C.: The Radiographic Study of the Abdominal Organs after Inflation of the Peritoneal Cavity.** *California State J. M.*, 1920, xviii, 42.

The author discusses briefly the advances made in roentgenography by the injection of oxygen and air into cavities and describes his own technique.

Lorey in 1912 was the first to inject air into the abdomen for radiographic purposes but it was not until 1918 that the method was generally accepted.

The technique used by Alvarez is described briefly as follows:

Morphine having been given as a preliminary, a spinal puncture needle is thrust through the left rectus muscle near the navel. First a small quantity

of sterile salt solution and then about 2 liters of gas are injected. The needle is then withdrawn and the roentgenograms are made at once. The patient is kept in the prone position until the gas is absorbed as otherwise considerable pain is felt through the shoulders.

When this procedure is followed the gall-bladder and other abdominal organs stand out in the X-ray picture with remarkable clearness and even the ovaries and uterus may be demonstrated.

Instead of gas the author uses carbon dioxide which is absorbed more quickly than oxygen, being taken up in half an hour.

P. M. CHASE.

## LEGAL MEDICINE

**Hypothetical Questions, Expert Evidence, Etc.**

*Dameron vs. Ansbro (Calif.)* 178 Pac., p. 874.

The defendant was struck by a train while driving his buggy over a railroad crossing and was seriously injured. He was taken to a hospital conducted by the plaintiff. Upon examination the injured man was found to be suffering from ten fractures in the arms and legs and various other injuries. Under Dameron's treatment all of the fractures healed except one in the leg in which the bones overlapped and it was necessary to re-break the leg. Ansbro became dissatisfied with Dameron's treatment and called in another doctor. Dameron then sued Ansbro for medical services rendered, room rent, board, and nurse hire. Ansbro then filed a suit against the doctor for malpractice, alleging negligence and want of skill. The lower court consolidated the two cases and permitted the action for malpractice to stand as a set-off against the physician's claim. A judgment was entered for Ansbro and Dameron appealed.

Dameron's first ground for appeal was that the lower court erred in overruling his objections to hypothetical questions which were put to a physician called by Ansbro as an expert witness. The facts in the case having been given the expert witness, he was asked how long he believed the patient's recuperation was delayed by the alleged negligence, and also whether or not in his opinion as a physician and surgeon the manner in which Dameron had treated the patient was good surgery. Dameron's chief objection to the question was that in stating the case to the expert witness, important facts such as the condition of the patient, the presence of the fracture, the results obtained, the date of injury, etc., were omitted. With regard to this question the upper court held that considerable latitude must be allowed in the choice of facts as the basis of any hypothetical question, and if the question is fair and understandable by the witness, it is not to be excluded because it does not comprehend all the important facts in the case. The court further held that there was nothing in the records of this case to show that the recital of the facts alleged to have been omitted were necessary to enable the expert witness to form an intelligent opinion, and the lower court



did not err in overruling Dameron's objections to the question.

The second ground for Dameron's appeal was that the lower court erred in allowing the introduction of a statement made by another physician who was present at the time of the alleged negligent treatment. On this point the upper court held that a declaration made by a physician at the time of the treatment is admissible as part of the *res gestæ* and may be included in a hypothetical question, but that in this particular case the statement was made by a physician who was merely present and not engaged or interested in the treatment. His statements were therefore hearsay and not admissible and the lower court erred in allowing their introduction.

The third ground for appeal was that the lower court erred in permitting the action for malpractice to stand as a defense or set-off against the suit by Dameron for medical services, etc. On this point the upper court held that the action for malpractice should stand as a defense or set-off against the doctor's action for medical services, but could not stand as a defense against the claim for room rent, board, and nurse hire as Ansbro was liable for these regardless of whether the doctor used ordinary skill or was negligent.

The fourth ground for appeal was that the lower court erred in denying the expert witness permission to exhibit to the jury a human skeleton to aid them in understanding the facts. The upper court held that the exhibition of the skeleton to the jury was within the sound discretion of the lower court and it was not an abuse of that discretion if the court denied permission for the exhibition, feeling that the exhibition would not aid the jury.

Because of the errors complained of the judgment of the lower court was reversed.

J. A. CASTAGNINO.

**Disease Resulting from Accident.** *Metropolitan Casualty Insurance vs. Edwards (Tex.)* 210 S. W., p. 856.

The defendant, while attempting to alight from an automobile, slipped and fell, striking the edge of the door of the automobile and sustaining an injury in the groin. Under the terms of his policy he was entitled to \$25.00 per week for the period of his disability which covered several months as a hernia developed which necessitated an operation.

The insurance company refused to pay for the full period of the defendant's disability on the ground that hernia was not the direct result of the accident, that hernia could not result from such an accident, and that the insured must have been suffering from it prior to the accident. Edwards sued the company and obtained a judgment for \$1,180.00 which was appealed by the company. The upper court held that the evidence of the case clearly showed that the insured was in perfect health prior to the accident, and that hernia could result from such an accident. The judgment of the lower court was therefore affirmed.

J. A. CASTAGNINO.

**Privilege as to Physician Employed Prior to Injury.**

*Hirschberg vs. Southern Pacific Company (Calif.)*, 183 Pac. R., p. 141.

The plaintiff went to the station of the defendant railroad to secure her baggage. The agent demanded an excess charge before he would deliver the baggage and in the altercation that ensued the agent seized the plaintiff by the arm and threw her down on the stone floor, permanently injuring her in the lower abdomen and causing a misplacement of the uterus. A judgment having been entered for the plaintiff in the sum of \$3,500.00, an appeal was taken by the railroad company.

The only question raised in the appeal was whether or not the lower court erred in excluding the testimony of the physician. The physician had treated the plaintiff for misplaced uterus several years prior to the alleged assault and the railroad attempted to introduce his testimony to show that the assault did not cause the misplacement of the uterus. The plaintiff objected to the introduction of this testimony on the ground that it was a privileged communication between the plaintiff and the physician, but the railroad contended that the plaintiff waived her privilege by testifying herself and also by allowing her physician to testify in the action for assault.

In reviewing this phase of the case the Supreme Court held that the privilege is waived whenever the person entitled to the protection of the statute voluntarily makes public matters of which a disclosure without his consent is forbidden, and that therefore when a client or patient voluntarily introduces evidence of communication between himself and his physician or lawyer the physician or attorney may testify in respect thereto. It held also that if a patient offers the testimony of one of several physicians attending the case at the same time the privilege has been waived (*Morris vs. Ry.* 148 N. Y. 88), and then when different physicians have treated a patient at different times for the same injury the privilege is waived (*Lawrence vs. Morning Journal* 32 App. Div. 71). In the present case it was held that the treatment by the physician several years prior to the alleged assault was not for the same injury and therefore the testimony of the physician should have been excluded. The judgment of the lower court was affirmed.

J. A. CASTAGNINO.

**Release Not a Bar to Action for Roentgen-Ray Burns.**

*Wheat et al. vs. Carter (N. H.)*, 106 Atl. R., p. 602.

The question before the court was whether or not a release by an employee of any claim he might have against his employer for injuries sustained would bar the employee from action against a physician who was responsible for the injury.

Carter, while employed by Fellows and Company, injured his hand and employed Dr. Wheat to treat the wound. Dr. Wheat, in taking an X-ray picture of the hand, burned it severely. Carter released Fellows and Company from all liability and later sued Dr. Wheat for the injuries sustained in the

X-ray examination. Dr. Wheat contended that by releasing Fellows and Company, Carter was barred from his cause of action against him. The lower court entered a judgment against the doctor. This judgment was appealed.

The upper court held that the release of one of two parties jointly liable for the same injury releases the other from liability but in this case the evidence showed that Carter released Fellows and Company from liability due to the original injury to his hand, while his action against Dr. Wheat was for injuries sustained in the taking of the X-ray picture and hence did not bar his action. The judgment of the lower court was affirmed. J. A. CASTAGNINO.

**Liability for Erysipelas—Touching Reputation.**

*Hanson vs. Thelan (N. D.), 173 N. W. R., p. 457.*

The history of the case was as follows:

The plaintiff, a minor, fractured his right leg between the knee and ankle and the defendant, a physician, was called to treat it. The physician applied ice packs for three days to reduce the swelling, then reduced the fracture and enclosed the leg in a plaster of Paris cast. About a week later he removed the cast and tightly bound the leg with a cloth. After three weeks he removed the cloth and placed a board under the leg, wrapped the leg in bandages, and attached a 10-lb. weight to the foot. The patient complained of sores on the foot. A few weeks later the board and bandages were removed, a shoe was laced on the foot, and a weight hung from it. When the shoe was removed subse-

quently the foot was found to be black and blue. The patient was then taken to the hospital by another physician who had been called in. Erysipelas had developed and the patient was confined to his bed for several weeks.

Later a suit was begun against the physician for damages. The physician contended that he used ordinary care and that no evidence introduced by the plaintiff showed that he was negligent. He contended also that his reputation as a physician was at stake and if the court found against him it would condemn him as incompetent and a careless practitioner. The lower court found in favor of the patient, and entered a judgment against the physician. This was appealed.

The upper court in reviewing the case held that a physician owes to his patient the duty to exercise reasonable and ordinary care, diligence, and skill such as is ordinarily possessed by physicians in the same general line of practice. It further held that the question raised in this case was whether or not erysipelas developed from the methods of treatment and whether the physician was negligent in his duty in that regard. The evidence in this case clearly showed that the erysipelas was a result of the methods used by the physician in treating the fracture and that the physician was negligent. As to the reputation of the physician, the court held that as everyone occasionally makes mistakes a judgment against him would not reflect on his reputation. The judgment of the lower court was affirmed. J. A. CASTAGNINO.



# GYNECOLOGY

## UTERUS

**Frederick, E. V.: The Treatment of Obstructive Dysmenorrhœa.** *Canadian M. Ass. J.*, 1920, x, 243.

The advantages of a mechanical stem after a dilatation for obstructive dysmenorrhœa are: (1) that after vigorous and prolonged dilatation the orifice is still small; (2) that contraction soon takes place unless pregnancy soon follows; (3) that prolonged dilatation of fibrous tissue causes it to become more permanently stretched; and (4) that pain is usually relieved as long as a foreign body is retained in the cervix.

The theoretical objections to a solid stem are: (1) that it may interfere with drainage from the cervical canal; (2) that its small size does not give sufficient dilatation; and (3) that it may cause perforation of the rectovaginal wall by pressure necrosis.

To overcome the objections and to retain the beneficial effects, a stem in the form of a thick hollow glass tube was devised 2 in. long,  $\frac{1}{2}$  in. in diameter. The upper end of this tube is smoothly rounded in the flame and the lower end attached to a rounded, flat vulcanite boss. In the side of the vulcanite boss two holes are drilled for the passage of a needle and suture. The advantages of the instrument are: (1) full dilatation; (2) free exit for discharges; (3) provision for silk suturing so that it may be retained as long as desired; and (4) protection against perforation of the vaginal wall. This stem has been found satisfactory in selected cases of obstructive dysmenorrhœa.

W. F. HEWITT.

**Morand, P.: Three Cases of Cancer Developing Rapidly in Uterine Fibromata during Radiotherapy** (Trois observations de cancers à évolution extrêmement rapide greffés sur des fibromes utérins au cours de leurs traitement par la radiothérapie). *Bull. et mém. Soc. de chir. de Par.*, 1919, xlv, 1553.

The author's report is based upon merely the clinical evidences of malignancy. The patients were 54, 47, and 51 years of age, respectively, and the first manifestation of the condition in every case was a very severe hæmorrhage occurring suddenly after the cessation of menstruation. In the first case death occurred two and one-half months after the hæmorrhage, and in the third, thirty-three days later. In the second case a laparotomy was performed nineteen days afterward and even at that time only a thin shell of the fibroma remained and the malignant tumor had attained a large size.

Delbet, who submitted Morand's report before the Société de Chirurgie, discussed in detail the pos-

sibility of cancer arising from the use of the X-rays. While in strong dosage the roentgen ray kills cancer cells, in weak dosage it stimulates them. In a recent report, however, Beclère stated that after treatment with the X-ray he found a surgical operation necessary in only 4 out of 400 cases of fibroma and did not observe a single case of malignant change.

Whether the treatment of fibromata in women under 40 years of age should be surgical or roentgenological is still open to discussion. Sphacelous and infected fibromata and those complicated by salpingitis, however, demand surgery.

In the therapeutics of fibroma the limitations of radiotherapy and its indications concern every surgeon and therefore every surgeon should put his experiences on record in order that the methods indicated for the various types of fibroma may be clearly defined. Delbet recently operated upon two cases of fibroma in which roentgenotherapy had failed completely. In these instances he noted unusual adhesions about the growth and retraction of the parietal peritoneum.

W. A. BRENNAN.

**Evans, N.: Malignant Myomata and Related Tumors of the Uterus; Report of 72 Cases Occurring in a Series of 4,000 Operations for Uterine Fibromyomata.** *Surg., Gynec. & Obst.*, 1920, xxx, 225.

The cases reported upon were studied in an endeavor to obtain microscopic criteria of malignancy by correlating the histologic findings and the clinical histories.

Kelly and Cullen hold that malignant myomata frequently originate within the structure of fibroids. The author concludes from his observations that this mode of origin is not common and that the tumor arises from the uterine musculature, the structure of which either remains unchanged or undergoes a gradual diffuse transformation.

Myomata in the early stages of malignancy are difficult to distinguish clinically, and sometimes even at operation, from benign fibromyomata. Kelly and Cullen state that inequality and increase in the size of the tumor cells is evidence of malignant change. Other authorities consider the presence of large irregular nuclei and giant cells as indications of the extent of the malignancy. Mallory holds that mitotic figures in myomata signify that the growth is capable of infiltrating and is therefore malignant. Proper and Simpson believe that the absence of mitotic figures indicates that the tumor is benign.

In reviewing his cases the author shows the definite relationship between the number of mitotic figures and the clinical outcome of the disease.

On the basis of the number of mitotic figures present, the tumors studied were divided into three

clearly distinct groups. The first group was composed of 13 tumors showing between 2,200 and 12,000 mitotic figures per cubic millimeter. In the second group were 10 specimens with mitotic figures ranging from 200 to 500 per cubic millimeter. In the remaining group mitotic figures were rarely found.

Group 2 is in striking contrast to Group 1 as no tumors were found in which the number of mitotic figures fell between 500 and 2,200. No recurrences have been noted in this group or in Group 3. Eleven of the 13 patients in Group 1 had recurrences from one to eighteen months after operation. The ages of these patients averaged 50 years, while those of all the others averaged 40½ years.

The author mentions the frequent occurrence of large atypical mitotic figures which he regards as a sign of high grade malignancy.

The tumors in Group 2 were probably in a transitional stage, on the border line between the definitely malignant tumors and the remaining cellular tumors. The growths in Group 3 were potentially malignant.

True tumor giant cells are to be differentiated from foreign body giant cells found in tumors, in the lesions of infectious granulomata, and in association with foreign bodies in the tissue.

Tumor giant cells, which in most cases are indicative of high grades of malignancy, are large, irregularly shaped, lightly staining, indistinct bodies with unequally sized, deeply staining nuclei usually arranged in a ring at the periphery of the cell. Foreign body giant cells are easily distinguished by their compact, deeply stained cytoplasm and their centrally located, small, round nuclei.

Recent experimental work has shown that the process of mitosis or indirect cellular division is related to the invasive powers of malignant tumors. In myomata of low malignancy in which no mitotic figures were seen there was evidence that the tumor growth was carried on by direct cell division.

In addition to mitotic figures, the author gives several other important microscopic criteria of malignancy, namely: large cells with a marked inequality in size; a relative decrease in the fibrous stroma; blood vessels without demonstrable walls; and a relative increase in the size of the nucleus as compared with the mass of cytoplasm of the cell body.

According to statistics, the relative incidence of malignant myomata to uterine fibroids varies from 0.4 to 7 per cent. The author holds that this wide variation is due partly to the lack of uniform standards for grading malignancy.

The cut surface of malignant myomata is smooth and grayish yellow. The tissue is softer and more friable than the fibrous structure of the ordinary fibroid.

In tumors of marked malignancy there is infiltration of neighboring tissues, but the less malignant growths may be as clearly demarcated from the surrounding myometrium as the ordinary fibroid.

Malignant myomata are often indistinguishable clinically from ordinary fibromyomata. A rapidly

growing tumor in a woman beyond the menopause is suggestive of malignancy.

The most satisfactory treatment of fibroids of any appreciable size is surgical removal. In the 72 cases reported there were no operative deaths.

A. J. SCHOLL, JR.

#### ADNEXAL AND PERI-UTERINE CONDITIONS

**Ezquierdo, A.: Salpingitis and Neoplasms in Prolapse of the Uterus** (La salpingitis y las neoplasias en el prolapso del utero). *Arch. de ginec., obst. y pediat.*, 1919, xxxii, 236.

Prolapse of the uterus should be regarded as a vaginal hernia behind which lie the adnexa and intestines in a peritoneal pouch. The base of this pouch is formed partly by the uterus and its ligaments.

When uterine prolapse is complicated by inflammatory processes or new growths its treatment becomes much more difficult because of the loss of tone in the ligaments and fascia of the pelvic floor. In many of the author's cases it was impossible to tell whether the salpingitis has been a contributory cause of the prolapse or had developed subsequently. However, because of their tendency to cause fixation by means of adhesions, inflammatory processes are regarded as unimportant in the etiology of uterine prolapse. An inflammatory mass may displace the uterus in any of the usual malpositions but its displacement downward in such cases is never as great as in cases of prolapse.

The beginning of prolapse is usually a retroversion which later may develop into a retroflexion. Such a position is unfavorable for the exit of the natural uterine secretions and of the transudates which result when the uterine circulation becomes stagnant. A chronic endometritis with more or less hæmorrhage and leucorrhœa may develop, but is not of great importance until it extends into the tubes and gives rise to salpingitis. Pelvic adhesions and tubal retention with foci of sterile pus may develop, and later, when malposition or prolapse is brought about by other causes, an acute exacerbation of the dormant salpingitis occurs.

At this stage the inflammation is more or less limited. It cannot extend upward and the uterus is somewhat immobile. Usually, however, the process will extend backward because of the greater space in the concavity of the sacrum and coccyx. The anterior wall of the rectum becomes involved and often is dragged down to form a pouch. Digital examination of the rectum is accordingly very important in order to identify this pouch and its relation to the adnexal tumor.

The diagnosis of the condition described is based upon the previous history, the evolution of the process, pelvic pain, evidence of vesical compression, and the findings of rectal and vaginal palpation. Fever is of importance in differentiating an inflammatory process from a uterine tumor or an intraligamentary cyst. Usually the patient suffers first from prolapse, the salpingitis remaining dormant.



When, after being freely movable, the uterus becomes somewhat fixed and there are strong pelvic pains, the development of a salpingitis or an acute exacerbation of a chronic salpingitis should be kept in mind.

Urinary incontinence often results from the compression. When the bladder is also prolapsed there may be incontinence with retention. Meteorism may be produced by compression upon the rectum and in some cases there is intestinal obstruction.

Vaginal hysterectomy is not advised. A hysterectomy performed upon inflamed, congested, and friable tissues usually results in profuse hæmorrhage the source of which it is often impossible to locate. Moreover, because of the changed relations of the pelvic viscera it is easy to perforate the bladder and rectum or to incise the uterus. Complete extirpation of all inflamed tissue by the vaginal route cannot be effected and dressings will not protect the wound from the urine and fæces. Hernia of the intestines has also been known to follow hysterectomy.

When there is suppuration the author first performs a posterior colpotomy and waits for improved conditions before attempting further operative procedures. This is an easy operation as the abscess is usually within reach. Drains are inserted and in some cases the cavity is irrigated. Instead of packing the vagina the drains are left in the wound and this results in a more efficient evacuation of the pus. When the suppuration has been reduced sufficiently a laparotomy is performed for the removal of the adnexa and the fixation of the uterus.

In some cases of carcinoma and sarcoma of the cervix and multiple fibroids, total hysterectomy is performed. The vaginal extremity is then sutured, a central aperture being left for drainage. The broad ligaments are then sewed to the angles of the vaginal stump and the uterovesical flap of the peritoneum is drawn over the whole and stitched to the back of the vagina. Protective drainage is thus secured and the vagina is suspended by the broad ligaments in order to prevent a later prolapse.

When suppuration is present it is impossible to suture efficiently and therefore a hysterectomy cannot be performed. In such cases infected adnexa and other tissues are removed as completely as possible and a hysteropexy is done. A triangular flap of peritoneum with its base upward is removed from the anterior wall of the uterus. To the wound thus formed the parietal peritoneum of the anterior abdominal wall is sutured about a centimeter from the margin of the abdominal incision. The triangular flap is also sutured to the abdominal wall and in this way adequate fixation is secured. Stab-wounds of the anterior abdominal wall near the iliac spines and the insertion of drains as far as the pouch of Douglas are necessary when the suppuration is bilateral and extensive. Colpoperineorrhaphy may be performed at this time if indicated.

The great advantages of abdominal intervention are that the adnexal pathology may be accurately

explored, all diseased tissues removed, the suspensory ligaments re-enforced, and additional uterine support obtained.

W. R. MEEKER.

**Becerro de Bengoa, R.: The Importance of Certain Data in the Diagnosis of Ovarian Cysts** (Importancia de algunos datos para el diagnóstico de los quistes ovaricos). *Arch. de ginec., obst. y pediat.*, 1919, xxxii, 272.

Torsion of the pedicle is the most important complication of an ovarian cyst and of fairly frequent occurrence. Often the manifestations of torsion are somewhat obscure and mistaken for intestinal, nephritic, or hepatic colic or some condition of the stomach or appendix. Torsion compresses the veins of the pedicle without interfering with the arterial circulation. This produces a rapid increase in the size of the tumor as a result of the venous congestion and the increased secretion from the tumor wall. The obstruction may cause a hæmorrhage into the lumen of cystic tumors and areas of infarction in solid tumors. The gray glistening surface of the cyst is thus changed to a dull brown or reddish color. The damaged surface may develop adhesions to the intestines and omentum.

The clinical picture of torsion varies according to the rapidity of the twisting and the number and tension of the rotations about the axis. When the torsion takes place slowly there may be only moderate pain without severe constitutional symptoms and the torsion may even become untwisted. When the torsion is acute the picture is that of an acute abdominal condition such as peritonitis. The abdomen is rigid, distended, and extremely sensitive. The intestines become paralyzed and the pulse is fast and thread-like. Because of tension upon the adhesions the pain may be referred to points more or less distant from the site of the pedicle. The symptoms of a cyst on the right side may thus be referable to the left side.

If the tumor does not become septic the attack may pass off but if the tumor is not removed the torsion may recur at some future time. The tumor may also become densely adherent to the walls of the intestines. If the adhesions are attached chiefly to the omentum a fresh blood supply may be established.

Moderate-sized cysts are easily distinguished by their smooth round surface, cystic consistency, and independent movement. Tense cysts may be confused with pedunculated fibromyomata. Intraligamentary cysts may be mistaken for sactosalpinx, œdematous myomata, or the pelvic hæmatocele of an ectopic pregnancy. Large ovarian cysts are usually diagnosed more easily. The lower end may be palpated with the finger in the vagina and a transmitted wave of fluctuation obtained between the two examining hands. The normal uterus will usually be found to be displaced to one side or the other. When the patient lies on her back the cyst will be discovered next to the anterior abdominal wall and the intestines are in the flanks. The



anterior abdominal wall is thus dull to percussion and the flanks are tympanitic. In ascites the reverse is true.

Renal tumors usually extend higher up in the hypochondrium than ovarian tumors and can rarely be palpated with the finger in the vagina. Tumors of the kidney large enough to be confused with ovarian tumors cause a fullness in the triangular space made by the costovertebral angle when the patient is in the sitting position. W. R. MEEKER.

#### EXTERNAL GENITALIA

**Bland, P. B.: Gonorrhœal Infection in Childhood.**  
*N. York M. J.*, 1920, cxi, 489.

Gonorrhœa is one of the most troublesome and serious infections of early life. It is more frequent in the female than the male but rarely involves the pelvic organs. It is very highly contagious and very difficult to cure. In little girls it assumes the form of vulvovaginitis and it is this that the author discusses.

Vulvovaginitis is extremely common. Numerous epidemics of the condition have occurred in institutions for children.

The method of infection is usually indirect and in children under 10 years of age, nearly always accidental. The clinical thermometer, underclothing, bed linen, towels, and even the bath tub and bath water may transmit the disease. The belief that exposure of an infected person to a person who is uninfected will cure the disease is common among certain races and accounts for many of the cases of direct infection. Infection during parturition is extremely rare.

The systemic and local symptoms are usually mild. As a rule the vulva, vagina, and cervix are all involved. The common symptoms are local irritation and a profuse vaginal discharge.

The diagnosis is based on the history, physical examination, microscopic examination, and complement-fixation test. The discharge is first thin and watery, then thicker and sticky, and finally thin and watery again. There is marked inflammation of the vulva and urethral orifice but inflammation of the Bartholin glands is rare. As a rule the gonococcus is found easily in the acute and subacute stages but in cases of long duration its discovery becomes difficult. The complement-fixation test is of value when it is positive, but when it is negative it cannot be relied upon.

Some cases yield to treatment promptly, while others are very resistant and recur frequently, probably because of infection of the cervix or Bartholin's glands. In the latter type of case the prognosis is very unfavorable. Before the patient can be pronounced cured four negative smears over a period of a week and one or two negative serological examinations are necessary.

The author emphasizes the importance of preventive treatment. All vaginal discharges should be examined carefully with the microscope before a

patient is admitted to a home or ward for children. The active treatment should be given very carefully at first and should not cause any pain; otherwise the patient will resist all further measures. The treatment should consist of thorough cleansing of the vulva and douching of the vagina with water and later with a weak dilution of Lugol's solution in warm water twice daily, followed once daily with 20 minims of a 25 per cent argyrol solution injected into the vagina with a medicine dropper. The author has not obtained favorable results with vaccines. In the early stages of the condition the child should be kept as quiet as possible.

S. A. CHALFANT.

**De Lee, J. B.: Trichomonas Vaginalis Vaginitis.**  
*Illinois M. J.*, 1920, xxxvii, 186.

The intestinal canal harbors infusoria, among them trichomonas. Since it is impossible to grow the trichomonas and make inoculation experiments it has not been absolutely proved to be the cause of the vaginitis considered, but its absence from the normal vagina, its great abundance in typical cases, the failure of the ordinary treatment of vaginitis, and the immediate success of treatment directed against it, make this assumption highly probable.

The patient complains of obstinate vaginal discharge, pruritus, sleeplessness, burning, and general weakness. The vulva and vagina are reddened and often rough. In some cases minute hæmorrhages are seen in the vaginal epithelium. Sometimes the cervix is affected. The discharge, which is profuse, excessive, mucopurulent, thin, bubbly, and acrid, has a disagreeable odor. Its irritating character is shown by the erosion of the skin. Especially in fat women there is an obstinate and foul-smelling intertrigo.

In the treatment the patient is put to bed for two days. On the morning of the first day the vagina and vulva are scrubbed thoroughly and vigorously with tincture of green soap and water and a rough cloth. The soap is then rinsed off with sterile distilled water. This process is repeated three times, after which a douche of a 1:1500 bichloride of mercury solution is given with friction, every fold and crevice being washed. This solution is then washed out with sterile distilled water. The next morning the vagina is again washed with green soap and sterile water, after which it is packed with cotton soaked with glycerine and sodium bicarbonate (4 oz. glycerine and 1 oz. soda). The folds and crevices of the vagina are filled with the cotton and the vulva smeared with the mixture. The next morning the tampon is removed and a douche of sterile water is given.

The following morning the secretion is examined under the microscope for trichomonads. Usually they have disappeared. Douches of 2 per cent soda and water solution are then given in the morning and evening. If the organism is still present the treatment described is repeated. In the author's cases this has never been necessary.

EDWARD L. CORNELL.



**Martius, H.: Local Anæsthesia in Vaginal Operations** (Die Lokalanæsthesie bei vaginalen Operationen). *Med. Klin.*, 1920, xvi, 5.

Sacral anæsthesia was used for numerous vaginal operations at the gynecological clinic at Bonn. However, as in 5 per cent of the cases requiring such operations it was impossible to reach the spinal canal and in many others the anæsthesia induced in this manner was not complete, the parasacral method of Braun was adopted. This parasacral method was used in 42 operations. Complete anæsthesia was obtained in 31 cases. In the others a few drops of ethyl chloride were necessary, especially when the uterus was brought forward or when intraperitoneal work was done. There were three cases of complete failure.

The solution used was  $\frac{1}{2}$  per cent novocaine with adrenalin in amounts up to 210 ccm. In one case an abscess developed between the sacrum and the rectum, and in another there was skin necrosis at the site of the injection. In a third case the use of 320 ccm. of the solution was followed by collapse.

BRUENING (Z).

### MISCELLANEOUS

**Solomons, B.: Sterility.** *Surg., Gynec. & Obst.*, 1920, xxx, 173.

Forty-seven per cent of 436 women treated by the author for sterility were cured. This is an unusually good showing, particularly in view of the fact that an operation of greater or less magnitude was required in each case.

From his study of the subject the author draws the following conclusions:

1. Sterility is a condition which at the present crisis of the population demands the serious attention of the profession. It is incumbent on the proper authorities to endow hospitals sufficiently to allow them to carry out thorough investigations. Many women are denied admission to a hospital because of lack of funds.
2. Sterility is curable in a large number of cases if care is taken to select the appropriate treatment. When operation is necessary attention must be given to even minor details.
3. In nearly all cases requiring operation the abdomen should be opened.
4. The most common major abnormalities are backward displacement of the uterus and tubal inflammation.
5. The most common minor abnormalities are kinks of the tube and small cysts of the ovaries and broad ligament.
6. Dilatation of the cervix should be done in all cases requiring operation. Metal dilators should be used. The use of tents and pessaries which must remain in the uterus for some time should be avoided.
7. Even if sterility is not cured by operation the pathologic conditions present are corrected.
8. There is no mortality.
9. The male should be examined when necessary.

10. Acid cervical secretion alone is not a common sign of sterility.

11. The administration of glandular extracts, especially ovarian extract, is useful in selected cases.

12. The statement must be reiterated that in some cases conception is prevented by a physiological factor which still remains unexplained.

H. B. MATTHEWS.

**Ahumada, J. C.: Gynecological Affections in Relation to Syphilis** (Las afecciones gynecologicas en su relacion con la syphilis). *Rev. argent. de obst. y gynec.*, 1919, iii, 452.

Chief among the affections of the vulva, the vagina, and the uterine cervix is the primary lesion of syphilis. This may simulate almost any other form of ulceration. It may be chancroidal, pyogenic, or granulomatous. The best way to arrive at a diagnosis is to study the organisms present. As there is always the possibility of a mixed infection, however, syphilis should be borne in mind in the examination of every case of gynecological infection. The phagedenic ulcer of the tertiary period is the most common of all phagedenic ulcers. The author has found these lesions on the labia majora, the vaginal introitus, the anterior vaginal wall, and the vestibule.

Vulvar leucoplasia, which is usually associated with a kraurotic condition, appears to be a manifestation of syphilis and must be differentiated from true kraurosis vulvæ due to trophoneurosis or chronic pruritis of the vulva. Another condition of the vulva which may be due to syphilis is elephantiasis. This is closely related to chronic syphilitic induration of the vulva.

The vagina is the portion of the genital tract most rarely affected by syphilis. Tertiary lesions in a state of ulceration are sometimes found there but usually originate as gummata in the surrounding tissues. In some cases fistulæ are established and deformities result from cicatrization.

The uterine cervix probably comes fourth in order of importance as regards the development of chancre, the other portions being, in order, the labia majora, the fourchette, and the vestibule. Tertiary syphilis of the cervix is rare and gummata are exceptional. When the activity of a syphilitic lesion subsides a cervical sclerosis may result.

Menstrual irregularities due to syphilitic ovaritis of the second stage are quite frequent. It is thought that the spirochæta pallida has a direct action on the ovary and graafian follicles which may result in an ovulation comparable to an azoöspemia. The menstrual irregularities due to secondary syphilis are infrequency, irregularity, oligomenorrhœa, amenorrhœa, and occasionally metrorrhagia and menorrhagia.

Another form of syphilis of the ovary in the second stage is characterized by tumefaction associated with nocturnal and menstrual exacerbations of pain sufficiently severe to render the patient

bedfast. This form is often confused with adnexa inflammations of other etiology.

Little is known concerning late syphilitic lesions of the body of the uterus. Examinations of the curetted endometrium in cases of metrorrhagia which have responded to treatment for syphilis have failed to establish the presence of a syphilitic endometritis. It is possible that syphilis may produce a visceral sclerosis beginning in the smaller arteries as well as a simple arteriosclerosis. Isolated cases of uterine syphilis have been described but the proof has usually been incomplete, the diagnosis being based upon the response to treatment for syphilis rather than histopathologic study. No relationship between syphilis and fibromata has been found by the author. Occasional cases of gumma of the tubes and ovaries have been reported.

Gummatous infiltration of the pelvic connective tissue is rare and usually perivaginal in origin. The vaginal walls may become infiltrated and the intestines included in the cicatrices of old ulcerations.

W. R. MEEKER.

**Sicilia: The Treatment of Gonorrhœa in the Female** (La cure de la blenorragia femenina). *Siglo méd.*, 1920, lxvi, 1079.

The treatment of gonorrhœa in the female presents marked difficulties. The complexity of the passages, the frequency with which, even from the beginning, numerous localities are involved—urethral, cervical, diverticular, and glandular—and the tendency of the condition to ascend, are all obstacles to treatment. Another factor of no little importance is menstruation which not only continues but lasts longer than usual in many cases of gonorrhœa of the uterus, especially in the first stages of the disease.

When the patient comes under observation at the beginning of the process the secretion visible at the meatus will usually be found to contain numerous gonococci and is thick and whitish or somewhat yellowish. The cervix uteri secretes a thick mucopurulent discharge which covers the cervix and settles in the vaginal vault. The urethral discharge also is copious.

The method of treatment which has given the best results in both acute and chronic cases and which can be adapted with slight variation to the various locations of the lesions and the varying bacterial flora is the following method which the author recommends also for its simplicity and effectiveness and the fact that it can be used by any physician:

First the vagina and the cervical canal are treated by lavage. The irrigation must be sufficiently forcible to remove all the mucus and pus. A solution of potassium permanganate varying in strength from 1:4000 to 1:2000 is used, to which is added progressively between 20 and 100 drops of a 5 per cent solution of silver nitrate. The silver nitrate is added toward the end of the first week,

or better, when the acute subjective symptoms, such as pain and frequency, have subsided. In increasing the solution, the patient's tolerance and the aspect and quantity of the mucus and pus must be taken into consideration. After a pint or so has been used to wash off the thick discharge, the point of the cannula is applied to the cervical orifice (which is easily done in the cases of parous women), or brought as close to it as possible so that the hot antiseptic fluid may penetrate into the first portion of the uterus. In general, the lavage is continued until the mucosa assumes a brown tint showing that the permanganate has been well absorbed.

When the mucosa is fungous or ectropion and the thick discharge is not promptly modified the author makes an endocervical application of a 5 or 10 per cent solution of nitrate of silver. He washes off the excess with a little of the lavage solution, finishing by swabbing the cervix, and often the vagina also, with a 5 per cent potassium permanganate solution. In the early stages, when the gonococcus is the predominating organism or the only organism present, he sometimes injects a 5 per cent solution of argyrol or protargol deep into the cervix.

The treatment of the urethra is as follows:

1. The urethra is irrigated with potassium permanganate solution alone or combined with methylene blue or nitrate of silver, the dose being graduated according to the local condition. A cannula with a double flow and from 2 to 4 qt. of the solution are used.

2. An injection of about 10 ccm. of a 5 per cent solution of argyrol or protargol or a mixture of both with albargin is made and the patient told to refrain from urinating as long as possible. If after some days the discharge has not abated or if it has a suspicious character, a few drops of a 10 to 20 per cent solution of silver nitrate may be added to the strong solution of organic silver.

Sicilia has had positive cures with this method even in cases of gonorrhœa of eight or more months' duration in which there was persistent discharge with deformity of the uterus. In these cases the sticky discharge, stained with thionin, methyl green, or fuchsin, showed large numbers of irregular and elongated cells superimposed upon one another and containing one or more nuclei with heavily stained chromatin. In the detritus caused by the destruction of the stratified pavement epithelium of the cervix, small lines and rings of points like streptococci were seen. These were probably saprophytes or colon bacilli.

M. M. MATTHIES.

**Piccardo, T. J.: The Schauta-Wertheim Operation in the Treatment of Genital Prolapse.** (La operación de Schauta-Wertheim en el tratamiento del prolapso genital). *Rev. argent. de obst. y ginec.*, 1919, iii, 405.

In the treatment of prolapse of the uterus Piccardo uses a modification of the Schauta-Wertheim operation which he believes is more simple and



more efficient than the original operation. Briefly, this procedure is as follows:

A single median longitudinal incision is made in the vesicovaginal wall and the two lateral flaps are dissected back for the formation of a subvesical cavity to receive the body of the uterus. A small incision is then made into the vesico-uterine peritoneal sac, the vesico-uterine ligaments being ligated, and this opening is enlarged with a clamp so that the body of the uterus may be passed through it. It is not necessary to repair this peritoneal opening as in the original operation.

If there are no perimetritic adhesions, the body of the uterus is now delivered through the peritoneal incision. The supravaginal portion of the cervix is seized with traction forceps, and other forceps are applied successively higher up along the anterior median line of the corpus. The uterus is delivered with a small amount of traction. The fundus is pulled down by a finger introduced into the peritoneal cavity only when adhesions make this necessary.

If the operation is performed during the reproductive period the patient is sterilized as the new position of the uterus is not compatible with gestation. The tubes are therefore ligated twice and severed.

The next step, subpubic fixation and suspension of the uterus, is a departure from the original Schauta-Wertheim technique according to which the uterus is sutured to the anterior vaginal walls. Piccardo maintains the uterus in the new subvesical position by means of two silk sutures each of which connects a lateral end of the subarcuate ligament of the pelvis with the uterine horn on the corresponding side. The greatest difficulty here is the passing of the suture under the subarcuate ligament. The ligament is located with the index finger of the left hand which is used also to protect the urethral canal. When the suture has been properly placed under the ligament the resistance is very firm and the tissues will not yield to traction on the suture material. When the two sutures are in place the uterus is fixed quite firmly in a position behind and below the pubic symphysis.

The vaginal incision is closed with interrupted catgut sutures. To strengthen the subvesical fixation and aid in effecting hæmostasis these sutures include also a portion of the body of the uterus. The original incision is thus completely closed, none of the corpus uteri being left exposed.

In cases of relaxed perineum, colpotomy with suture of the levatores ani by the usual method is also done.

W. R. MEEKER.

# OBSTETRICS

## PREGNANCY AND ITS COMPLICATIONS

Titus, P., Hoffmann, G. L., and Givens, M. H.: *The Rôle of Carbohydrates in the Treatment of Toxæmias of Early Pregnancy.* *J. Am. M. Ass.*, 1920, lxxiv, 777.

The authors assumed that there is a definite relation between the milder and graver types of the toxæmias of early pregnancy just as there may be a relationship between these toxæmias and those of later pregnancy known as acute yellow atrophy of the liver, pre-eclamptic toxæmia, and eclampsia. Therefore it appeared reasonable to suppose that a study of the milder types of toxæmia might disclose important facts relative to the origin of the more serious toxæmias. As a means to this end cases of the early toxæmias of pregnancy of varying degrees of severity were treated upon the theory that the condition is due to a deficiency of carbohydrates in the diet.

The daily regimen for an ordinarily mild case of nausea and vomiting was as follows: a soda cracker breakfast before arising; a light breakfast at the regular time; unsalted soda crackers and milk in the middle of the morning; a light lunch without meat or pastry at lunch time, the dessert being cornstarch, rice pudding, or custard; afternoon tea with arrowroot biscuits or bread and butter sandwiches; a light dinner or supper similar to the luncheon with some sweets and possibly raisins or dates for dessert; a bowl of bread and milk at bed time; and crackers and water on the bedstand to be taken during the night.

This diet was found sufficient to relieve an average case of nausea and vomiting if attention was paid to elimination. A list of foods rich in carbohydrates is given but the authors point out that the entire elimination of proteins and fats is by no means essential.

Women whose vomiting is becoming progressively worse require more detailed care and observation. In such cases all food should be withheld for a period varying from twenty-four to thirty-six hours, and food residue, bile, and mucus should be removed from the stomach by gastric lavage two or three times daily. As in these cases there is a certain amount of reverse peristalsis, cathartics, such as magnesium sulphate, should be passed in through the tube to re-establish normal peristalsis. Enteroclysis of glucose and soda solution, the usual rest in bed, and sedatives such as chloral and bromides should be prescribed. After the initial period of rest, during which emesis usually subsides, the authors give from 1 to 1½ oz. of whey, peptonized milk, skimmed milk and vichy, or buttermilk alternately with 2 oz. of a 10 per cent glucose solution and

2 per cent sodium bicarbonate solution every two hours. If the patient's condition permits, 1 qt. of the 2 per cent soda solution is administered daily by mouth or rectum. Otherwise intravenous injections of plain glucose are given and repeated as indicated. No serious reactions have been observed in the authors' clinic from glucose solution given intravenously. For the injection of from 15 to 20 gm. of glucose in 250 ccm. of sterile water one-half hour is allowed. The appearance of glycosuria indicates that the amount of glucose should be reduced. Small amounts of water should be given frequently. Ordinarily by the third or fourth day cream soups, stewed fruits, cornstarch pudding, or ice cream may be allowed, but the glucose and soda by bowel and mouth should be continued. Crackers, cereals, milk-toast, custards, and sugar are next added to the diet.

The authors report 76 cases of toxæmia which they divide into three groups. Group 1 included 32 patients with irregular nausea and vomiting. Dietetic measures as outlined were sufficient in almost all of these cases although in a few the glucose and soda solutions were given at three-hour intervals. In 29 cases the improvement was immediate, while in 3 it was not noted until after a period varying from seven to fourteen days. All of the patients were relieved permanently.

Group 2 included 29 patients who were suffering from constant nausea and persistent vomiting which was constantly growing worse. Two had lost considerable weight and 1 was slightly jaundiced. Two had twin pregnancies and in both of these cases labor was premature. One showed the symptoms of toxæmia near the end of pregnancy. Prompt relief from nausea and vomiting was obtained in 23 cases; in 5, recovery was not so rapid; in 1 the nausea never completely ceased but the pregnancy continued to term.

In Group 3 there were 15 cases of the most serious type of toxæmia. Acetonuria was present in all and in the majority the urine contained albumin and casts. Many of the patients were jaundiced and all were emaciated and unable to retain food or water. These cases were seen in consultation and most of the attending physicians expected that therapeutic abortion would be necessary. Fourteen of the women recovered in from seven to fourteen days. An abortion was induced in only 1 case. This patient, who was three months' pregnant, deeply jaundiced, and emaciated, had been under treatment for five weeks in a hospital where there was religious objection to the induction of abortion. She had multiple neuritis and paræsthesia of the hands, arms, legs, and feet. The knee jerks were absent. A transfusion of blood was also



believed necessary in this case and the patient was kept in the hospital for several weeks.

The article contains a preliminary report of chemical and experimental investigations relative to the impairment of liver function by glycogen depletion and an attempt to devise a test for liver efficiency and deficiency. The ability of the liver to store a definite amount of glucose given intravenously to normal pregnant women is shown by a time curve. A study of similar curves in cases of toxæmia led to the conclusion that the prognosis is good if the liver is able to store between 75 and 105 mg. of glucose per 100 ccm. of blood within thirty minutes, this ratio being approximately equivalent to that of a normal pregnant woman. If it is able to store only between 30 and 40 mg. the situation is grave.

The conclusions drawn are as follows:

Carbohydrate deficiency in pregnancy is due to: (1) a relative deficiency from unexpected demands for glycogen on the part of the foetus and uterus, and (2) an actual deficiency which, in the presence of nausea and vomiting, is increased by a decrease in the carbohydrate intake. Carbohydrate deficiency causes glycogen depletion in the liver as this is the organ in which carbohydrates are stored for use as needed.

Experiments have shown that in carbohydrate starvation the function of the liver is impaired and the body is flooded with toxins. Pathologic changes in the liver lobules similar to those of the fatal toxæmias of pregnancy can be produced experimentally by the use of certain chemical poisons and made to disappear rapidly by the administration of carbohydrates.

H. K. GIBSON.

**Winans, W. W.: Influenza and Pregnancy—A Symposium.** *J. Am. Inst. Homœop.*, 1920, xii, 929.

Questionnaires were sent out to the members of the American Institute of Homœopathy and from the replies received the following statistics were compiled:

The number of reported cases of influenza, simple and complicated, was 2,772. Total influenza cases complicated by pneumonia, 118. Total pregnancy cases, 1 month before full term, 119. Total cases of pregnancy complicated by influenza, 71.

Total deliveries, reported premature or at term, between October 15 and January 15, 84. Stillbirths, 7. Infantile deaths, 6. Maternal deaths, 2.

Total deliveries before term from other causes, 17. Stillbirths, 8. One infantile death. One maternal death.

Total deliveries before term complicated by influenza, 7. Stillbirths, 4. Infantile deaths, 3. Maternal deaths, 1.

Total deliveries before term complicated by influenza-pneumonia, 15. Stillbirths, 3.

Total cases complicated by influenza, 60. Total deliveries complicated by pneumonia, 24. Infantile

deaths, 2. Maternal deaths, 4. Total deliveries at term, 109. Stillbirths, 2. Infantile deaths, 6. Maternal deaths, 1.

**Schulze, M.: Encephalitis Lethargica in Pregnancy.** *J. Am. M. Ass.*, 1920, lxxiv, 732.

The author's review of the recent literature discloses the records of 8 cases of lethargic encephalitis in pregnant women. There were no cases of nona complicating pregnancy in the epidemic of 1890.

Lethargic encephalitis appears to be far more common among males than among females. Of 189 cases reported in recent English and American literature only 67 were those of women and girls and of these only 33 were those of women of the child-bearing age. The mortality, however, is considerably higher among women than among men. Of 122 men, 72 recovered and 23 died. Twenty-seven cases were reported before the outcome of the disease was known. Of 67 women, 27 recovered and 24 died. In 16 cases the outcome was not known. The mortality rate among pregnant women appears to be particularly high. Of the 8 patients whose cases have been reported, 1 recovered and 5 died. The outcome in the other 2 cases is not given.

Schulze describes the recorded cases in detail. Neal's case, the only one in which recovery had resulted at the time of writing, was that of a young woman 25 years of age who had been pregnant for five months. Two weeks after an attack of influenza the encephalitis began gradually with headache, chills and fever, vomiting, sweating, and delirium. The spinal fluid showed a great increase in cells and protein, a negative Wassermann reaction, and a negative guinea-pig inoculation for tuberculosis. The patient's condition remained the same for two weeks or more. She then gradually recovered, the facial paralysis cleared up, and she was delivered normally at term.

The only other case beside the author's which came to autopsy was reported by Bassoe. The woman was 34 years of age, an octipara in the sixth month of pregnancy. Death occurred in the fifth week of the disease with hyperpyrexia and pulmonary oedema. The postmortem examination showed the usual changes, i.e., marked congestion of the vessels with perivascular round-cell infiltration, especially in the optic thalamus and pons.

The author's case was that of a pregnant woman 35 years of age who was one month past term. She showed a mild toxæmia with blood pressure 140:95 and a faint trace of albumin in the urine. For two weeks before she had complained of aching pains in the arms which at times were so severe as to require morphine to induce sleep. For ten days following a five-hour normal labor she had a low-grade fever which did not reach 38 degrees C. until the tenth day. She then fell into a state of semi-stupor from which, however, she could be easily roused. When addressed, she answered rationally, was clearly oriented, and on questioning complained of diplopia and sleeplessness due to the pain in her arms. A

slight ptosis of the left lid and facial paralysis on the right side developed. Laboratory examination showed the usual findings, a clean, sterile spinal fluid with 26 cells, negative Nonne, Noguchi, and Wassermann reactions and reduction of Fehling's solution. There was a moderate leucocytosis and the nasopharyngeal culture showed bacillus influenzae.

The neurological findings varied but the patient improved gradually. She had been free from fever for several days when on the twenty-sixth day after delivery she suddenly developed signs of pulmonary embolism and died. Postmortem examination disclosed a thrombosis of both femoral veins and extensive bilateral pulmonary emboli which occluded almost the entire pulmonary circulation. The brain was congested and there was a slight round-cell infiltration of the leptomeninges with marked perivascular infiltration and small hemorrhages about the vessels which were especially marked in the mid-brain and pons. The changes in the medulla were much less marked. The cerebral cortex was normal.

**Bugbee, H. G.:** Renal Complications of Pregnancy from the Standpoint of the Urologist. *Bull. Lying-in Hosp. N. Y.*, 1920, xii, 11.

The majority of patients with renal complications whom the author has seen presented active symptoms due to infection. If there was drainage, these symptoms were referred to the bladder (frequency, burning, and painful urination); if drainage was absent the symptoms were pain in the flank, tenderness in the costovertebral angle on one or both sides, and often tenderness in front. In some cases also it was possible to palpate the kidney. When drainage was poor, there was an elevation of temperature which was often associated with a slow pulse.

In 90 per cent of the cases observed the infection was due to the colon bacillus. In 75 per cent the bacilli were found on both sides, but in all of them the infection was more severe on one side than on the other. The kidney function was diminished.

It has been the author's practice in these cases to avoid any further manipulation than was absolutely necessary. The patients are often acutely ill, and no more should be done than is indicated to give immediate relief from the symptoms. This means the establishment of drainage. Several cases are cited:

In a woman four months' pregnant who complained of pain in the right upper quadrant of the abdomen a firm, irregular mass developed. The introduction of a catheter into the right renal pelvis resulted in the rapid discharge of clear urine which was free from infection. A pyelogram showed hydronephrosis. Abdominal exploration revealed a large fibroid which was attached to the right side of the fundus of the gravid uterus and pressed on the right ureter. The symptoms were relieved by the removal of the fibroid and the patient went to term.

In 2 cases, a ureteral calculus causing ureteral obstruction was found. In one, the calculus was passed following cystoscopic manipulation. In the other it was removed.

The treatment of renal complications during pregnancy resolves itself first into prophylaxis. Such infections will be prevented when the obstetrician and general practitioner realize more fully the important rôle of the kidneys during pregnancy. The patient's history should be taken more carefully, the catheterized urine should be examined bacteriologically as well as chemically, and any variation from the normal should be an indication for a complete urological examination.

When a kidney infection is already present, drainage should be established to relieve the toxæmia and the supply of toxins and bacteria should be cut off. This means the use of the ureteral catheter, retention of the catheter if necessary, lavage of the kidney pelvis, free fluids by mouth, colonic irrigation, and lastly, urinary antiseptics.

EDWARD L. CORNELL.

**Vital Aza:** Is It Prudent to Temporize in Cases of Ectopic Pregnancy? (¿ Prudente contemporización en el embarazo ectópico?) *Prog. de la clín.*, Madrid, 1919, vii, 220.

When abdominal pain and a tendency to collapse occur suddenly in a woman of child-bearing age the possibility of ectopic gestation must be taken into consideration, and when once an extra-uterine pregnancy is diagnosed operation is urgently demanded. The operation should be a laparotomy for the extirpation of the gravid sac.

In cases in which the clinical picture is that of intra-abdominal hemorrhage, absolute rest, the application of ice to the abdomen, and the administration of morphine are necessary. Injections of salt solution and the use of heart stimulants are absolutely contra-indicated. If the condition shows no tendency to improve or if after apparent improvement it again becomes worse, a laparotomy for the extirpation of the foetal sac should be done at once.

When a hæmatocele has formed, expectant treatment may be continued for a considerable length of time and in many cases may result in a complete cure.

If operation is planned in a case of recently formed uninfected hæmatocele, it should be a laparotomy.

If the hæmatocele has begun to suppurate the pus should be evacuated and a posterior colpotomy done.

M. M. MATTHIES.

**Spencer, H. R.:** The Lettsomian Lectures on Tumors Complicating Pregnancy, Labor, and the Puerperium. II. *Brit. M. J.*, 1920, I, 246.

The author reports 37 cases of fibroid tumors illustrating: (1) that many small tumors cause no difficulty in labor; (2) that some large tumors (8 of the series) give no difficulty; and (3) that malpositions of the pregnant uterus may be produced



by fibroids. It is estimated that fibroids are present in 1 of every 150 pregnancies. Before the twenty-fifth year of age they are rare. Usually they occur in the latter period of fertility and often are present in multiparæ over 40. Fibroids are considered unimportant factors in the causation of sterility and abortion, but sterility seems to favor their development and regular child-bearing and nursing to some extent prevent their occurrence.

The effect of pregnancy on fibroids is that of hypertrophy and hyperplasia, a gross enlargement with re-arrangement of position and shape due to the growth of the uterus. Degeneration and necrosis, pelvic impaction, inflammation, and secondary infection, especially in the puerperium, are the most frequent changes. After labor a diminution in size and a change of shape often occur. This is illustrated by two case histories, both those of primiparæ 36 and 42 years old, respectively. Torsion of a pedunculated tumor is a source of considerable danger.

The effect of fibroids on pregnancy is the introduction of several factors producing dystocia; namely, placenta prævia, abnormal presentations (breech presentation especially), œdema of the lower extremities, retention of the placenta, uterine inertia, and postpartum hæmorrhage. Case histories are given to illustrate most of these complications. In 3 cases enucleation of submucous fibroids was accomplished through the os uteri in the puerperium.

The error in the diagnosis of pregnancy with fibroids is more often an error in the diagnosis of the pregnancy. Cessation of menstruation is the chief early factor and later the uterine growth and breast signs are important. The "certain" signs may be obscured by the changes in the consistency of the uterine wall and the irregularity due to the tumors. Bulging of the anterior lower segment, which is never observed in normal pregnancy, is sometimes seen when fibroids are present, and when adhesions are present and the fibroids are situated in the fundus it is marked by retroposition. Case histories illustrating complicating tumor degeneration are given. In 1 case the tumor followed section and resulted in sepsis and death. In another, torsion had occurred in a 17-lb. tumor. In a third, torsion of a reniform fibroid resulted in sepsis, thrombosis, and death.

In all cases in which diagnosis is difficult, and especially in cases of inflamed, impacted, or twisted tumors, examination under anæsthesia is most satisfactory. Attention is called to the fact that submucous tumors may be overlooked unless they give rise to hæmorrhage or become degenerated. In the majority of cases the prognosis is good.

Induced abortion, premature labor, and forcible delivery past obstructing tumors are contra-indicated. Forceps may be used for inertia but not to overcome resistance. Craniotomy and embryotomy are permissible only when the fetus is dead and the mother is not infected. Vaginal myomectomy may be necessary for cervical fibroids but not for retrocervical tumors. Abdominal myomectomy is rarely indicated. It seldom removes all of the tumor pre-

sent, often leads to abortion, and necessitates later a hysterectomy for hæmorrhage. The tumor should be examined bacteriologically before removal, and if infected, the whole uterus should be taken. The author does not often perform myomectomy or hysterectomy.

Conservative cæsarean section is rarely indicated by the fibroids alone, but may be done in cases of contracted pelvis or malposition. Total hysterectomy following cæsarean section is preferred to amputation, especially as it provides drainage and removes a possibly infected cervix. In the puerperium, vaginal myomectomy is given as the method of choice for submucous tumors. Tables are presented covering the author's cases of abdominal myomectomies during pregnancy. Five of these cases are noted with one maternal death, 1 was operated upon for cystic myoma, 2 for torsion of a reniform pedunculated tumor, in 1 there was necrobiosis and in another, calcification with degeneration. Five conservative cæsarean sections are noted with one maternal death and no foetal mortality. One case was operated upon for a degenerating infected myoma of the lower segment and 4, for contracted pelvis and fibroids. Six cæsarean sections followed by abdominal hysterectomies are noted with no maternal mortality and one foetal death before operation. Fibroids were present in all of these cases. In 4 cases they were in the lower segment. In 1 they were in the fundus and produced retroflexion with adhesions. In 1 case there was a footling presentation. W. N. ROWLEY.

**Emerson, N. W.: Cæsarean Section.** *Boston M. & S. J.*, 1920, clxxii, 272.

As performed today cæsarean section is one of the most finished operations and so simple, so rapidly performed, and so definite that it is without danger. Its safety in competent hands has been definitely demonstrated under most astounding conditions. In cases in which the death of the mother is inevitable it will often save the child.

Contracted pelvis has always been a cause of difficulty in labor and often prevents a normal labor. If left to nature, the labor will be tremendously protracted and associated with much suffering to the mother and more or less danger to the child from the delay in moulding the head. The alternative has been the use of forceps, but these only add to the difficulties because they themselves take up some room in the pelvis. Some form of contraction of the pelvis is doubtless the most common cause for the application of high forceps. In Emerson's opinion cæsarean section will be the accepted method of the future in such cases.

In cases of placenta prævia all other methods should be discarded. Whenever placenta prævia is diagnosed, cæsarean section should be the only method considered, whatever the placement of the placenta, either lateral or central. Turning the child and forcibly delivering it, the hæmorrhage being controlled by compression, was accepted so long only because heretofore no other method was

## CASES TREATED BY CÆSAREAN SECTION (EMERSON)

Diagnosis	Operation	No. of Cases	No. of Operations	Cures	Deaths	Remarks
Albuminuria.....	Cæsarean section	6	6	6		One foetus a monstrosity
Breech presentation.....	"	4	4	4		
Cicatricial contraction of cervix uteri.....	"	1	1	1		
Contracted pelvis.....	"	33	33	33		
Double vagina.....	"	2	2	2		
Dystocia.....	"	30	30	30		
Dystocia; hydramnios.....	"	1	1	1		Foetus a monstrosity
Eclampsia.....	"	8	8	8		
Epilepsy.....	"	1	1	1		
Foetus dead.....	"	4	4	4		5 m., 5½ m., 7½ m., 9 m.
Hernia, ventral, postoperative.....	"	1	1	1		
Metrorrhagia gravidarum.....	"	1	1	1		
Mitral insufficiency; exhaustion.....	"	1	1	1		
Myomata uteri.....	Cæsarean section;					
	hysterectomy	1	1	1		
Myomata uteri.....	Cæsarean section;					
	myomectomy	1	1	1		
Occipitoposterior position.....	Cæsarean section	2	2	2		
Placenta prævia.....	"	6	6	4	2	
Postoperative adhesions.....	"	1	1	0	1	
Spondylitis.....	"	1	1	1		
Suspension of foetus in utero by cord.....	"	1	1	1		
Toxæmia.....	"	3	3	3		
Transverse presentation.....	"	2	2	2		
Uterine inertia.....	"	9	9	9		
Total.....		120	120	117	3	

known. The danger of placenta prævia lies in the hæmorrhage which it was impossible to control by the methods heretofore in use. It is a mechanical condition in which, because of its location, the placenta becomes obstructive and must be more or less dislodged before the child can be delivered. If the child can be extracted the uterus automatically takes care of itself whatever the attachment of the placenta. Therefore it is evident that when placenta prævia is recognized, the removal of the child before the mother is exhausted and before the child is affected would be the most practical method.

Other cases best dealt with by cæsarean section are those in which there is inertia or atony of the uterus and cases of malposition. Postoperative intra-abdominal complications due to adhesions from some faulty operation can be dealt with successfully only by a cæsarean operation.

Cases of pregnancy complicated by a fibroid require a hysterectomy. The only chance for the child is to conduct the pregnancy beyond the viable age if possible, and then do a cæsarean section. The cæsarean section should then be followed by a hysterectomy. In many of the conditions mentioned the first recourse has been the high forceps operation, but Emerson believes the day is approaching when this method and especially the use of axis-traction forceps will be discarded entirely.

When a cæsarean section is contemplated certain precautions should be taken. First, vaginal examinations should not be made unless necessary, and when necessary, should be done under the most aseptic conditions. Before the operation the vagina should be made thoroughly aseptic. When the operation is performed before labor has begun, care must be taken to see that there is some dilatation of the cervix.

A single examination should be sufficient. This examination should be made under complete asepsis even if the delivery is to be effected naturally. Repeated examinations which result in no definite action are a sign of incompetency.

In conclusion the author gives a summary of cases operated upon at the hospital with which he is affiliated.

C. H. DAVIS.

**Kosmak, C. W.: The Treatment of Certain Cases of Placenta Prævia by Conservative Measures.**  
*Bull. Lying-in Hosp. N. Y.*, 1920, xii, 51.

Among the unsolved problems of obstetrics there is none that demands attention more than placenta prævia. In its graver forms placenta prævia must be regarded as one of the most serious accidents of pregnancy and even in its less marked forms it is potentially dangerous.

Since the perfection of abdominal cæsarean section this operation has been widely advocated as one of the most satisfactory methods of treatment and in a limited class of cases it is of undoubted value. The Braxton-Hicks version with perforation of the placenta and the use of the foetal thigh as a tampon is becoming generally discarded except in emergencies. When in the case of a primipara presenting a rigid and only slightly dilated cervix a central placenta prævia is suspected but the child is at or near term and still in good condition because the amount of bleeding has not been extreme, the abdominal cæsarean section is the best method of delivery for both mother and foetus. The large majority of cases, however, do not belong in this group.

The vaginal pack seems to be the best means to stop the hæmorrhage, especially in an emergency, but the blood saturates the gauze or absorbent



cotton ordinarily employed and permits the collection of large clots about it. Therefore the use of the elastic bag instead of a gauze pack has been widely advocated. By the usual procedure the bag is inserted through the ruptured bag of membranes or the mass of the placenta, with or without traction to insure compression. In the attempt to introduce it, however, considerable bleeding may result because of undue placental separation. Kosmak, therefore, advocates the extra-ovular introduction of the bag.

The patient's condition must be carefully watched and if necessary a vaginal examination should be made at least every two hours. If the bleeding reappears an immediate examination is necessary because such bleeding usually indicates the expulsion of the bag. In many instances of incomplete placenta prævia rupture of the membranes occurs spontaneously about this time and the presenting part engages and descends. There is no need for haste and the labor may be allowed to proceed normally.

Bleeding may occur immediately after the delivery of the child. The author therefore believes it advisable to conserve the patient's strength as much as possible by immediate expression of the placenta followed by the injection of 1 or 2 ccm. of pituitrin or the administration of ergot by mouth if prompt uterine contraction does not result. Every case of placenta prævia should be carefully watched for postpartum bleeding. In cases treated by the method described intra-uterine packing has rarely been necessary.

The records of the New York Lying-in Hospital from June, 1904, to December 31, 1918, showed a total of 534 cases of placenta prævia, 75 deaths of mothers (14 per cent), and 105 deaths of children after delivery. A total of 223 stillbirths is recorded, making the total foetal mortality 328 (62 per cent). These cases were treated by a variety of methods other than the extra-ovular insertion of the bag. While this is rather an alarming proportion of both maternal and foetal deaths, the fact must be borne in mind that a great many of these patients were sent in by outside physicians after they had been treated by various methods and had had considerable hæmorrhage.

EDWARD L. CORNELL.

**Mathes, P.: Hæmostasis in Placenta Prævia Centralis** (Blutstillung bei Placenta prævia centralis). *Zentralbl. f. Gynaek.*, 1920, xlv, 57.

The author argues that the dangerous hæmorrhage in placenta prævia is not the primary hæmorrhage, but the hæmorrhage occurring after delivery of the child and placenta. As a rule this hæmorrhage is not due to tearing of the cervix but to tearing of the sinuses at the placental site. If the placenta is implanted in the isthmus the circular fibers of the uterine muscle will contract and compress the sinuses, but if the implantation is central this cannot occur because the circular fibers do not extend downward sufficiently far. The use of ergot or

pituitrin, therefore, will not be effective in cases of central implantation, and secondary hæmorrhages may occur even though the uterus is firmly contracted.

The author advises immediate manual separation of the placenta by means of the Kocher sound and immediate proximal ligation of all the vessels as they appear. Waiting for the hæmorrhage to cease has frequently resulted fatally. Waiting for the hæmorrhage to appear should also be avoided. As the sinuses have been compressed for some time before delivery the hæmorrhage may not occur immediately.

Cæsarean section does not do away with the danger as it will not be followed by contraction of the cervix. Jäschke has prevented hæmorrhage in such cases by tamponade of the cervix after the operation.

The author reports a case successfully treated by the method described.

L. A. JUHNKE.

**Frers, A.: Therapeutic Abortion** (Aborto terapeutico). *Rev. argent. de obst. y ginec.*, 1919, iii, 430.

The indications for therapeutic abortion as practiced by the author are summarized as follows:

**Pernicious anæmia.** The clinical and blood picture of primary pernicious anæmia often appears to be the result of pregnancy itself. An analysis of such cases often reveals an antecedent anæmia, chloræmia, albuminuria, rheumatism, or nephritis. This may be regarded as a latent condition which, aggravated by the pregnancy, becomes the cause of the pernicious anæmia. In many other cases the anæmia seems to be due entirely to the pregnancy. When untreated, this condition usually results in premature labor, the death of the foetus, or the death of the mother between the fifth and seventh months of the pregnancy. In cases of the metaplastic form of anæmia developing during the first three months, abortion should be induced at once. When the anæmia develops after the pregnancy is more advanced, and especially when it is of the hypoplastic form, the patient should be treated medically in the early stages, the pregnancy being interrupted later. In the aplastic form of pernicious anæmia, abortion as well as any other other procedure is useless.

**Pernicious vomiting.** In the first stage of pernicious vomiting expectant treatment should be employed. Later dietetic management and the use of sedatives and pluriglandular extracts (with the exception of hypophyseal extracts) are indicated. Most important are doses of from 20 to 30 min. of a 1:1000 solution of adrenalin, or from ½ to 1 ccm. of adrenalin chloride for three or four days. If there is no response to adrenalin or to ovarian and thyroid extracts it will be impossible to control the condition because of the profound intoxication. In such cases abortion should not be delayed.

**Albuminuria.** Albuminuria is a symptom which is of only relative value. An increase of albumin and the presence of casts in the urine in spite of

medical treatment, hypertension, oedema, oliguria, and especially a diminution in the urea content of the urine with an increase in the blood urea amounting to more than .50 should be regarded as an urgent indication for the termination of the pregnancy.

*Cardiac insufficiency.* When a heart lesion is present an estimate of the cardiac function should be made. This is difficult because of the lack of an efficient method. When there is cardiac insufficiency of only mild degree the pregnancy should be allowed to proceed to term. Aortic insufficiency of moderate degree and other cardiac lesions in which exertion is not tolerated should be regarded as indications for abortion.

*Pulmonary tuberculosis.* Abortion is indicated in incipient pulmonary tuberculosis as well as in the chronic forms in which the symptoms are aggravated by the pregnancy. It may be necessary also when the tuberculosis is associated with some form of intoxication even though the latter may not appear serious in itself. Apyretic, stationary, fibrotic, and articular forms of tuberculosis are usually compatible with pregnancy.

*Cancer.* When cancer of a pregnant uterus improves with radium treatment, the pregnancy may be allowed to go to term. If the tumor is operable and if in spite of the radium treatment it increases in size, the presence of the foetus should usually be disregarded. If the tumor does not respond to radium and is inoperable the greatest care should be taken to save the life of the foetus.

*Diabetes.* When diabetes responds to medical management pregnancy may be allowed to continue to term. When the sugar content of the urine increases in spite of treatment and especially if acetone appears, the pregnancy must be interrupted.

*Plastic operations on the perineum and vagina.* When extensive plastic work has been done on the genital canal recently (less than a year) interruption of the pregnancy is preferable to abdominal caesarean section.

W. R. MEEKER.

## LABOR AND ITS COMPLICATIONS

Appleton, P.: *Anæsthesia in Obstetrics.* Boston M. & S. J., 1920, clxxxii, 321.

Obstetricians are being led to the use of anæsthetics, first, because they are beginning to realize how much a properly given anæsthetic aids in safe delivery, and second, because relief from the pain and distress of labor is now being more generally demanded.

In addition to relieving subjective pain and its resultant exhaustion and shock, anæsthesia greatly conserves the patients' nervous energy and gives better control of the expellent powers. The patient who is exhausted by the nagging pain of a prolonged first stage of labor cannot meet the second stage with the same nervous equanimity and determined effort as the patient who has had help in the first stage and knows that she may have more help as labor progresses.

No single anæsthetic drug combines all the features desirable in obstetrics and certain anæsthetics have decided disadvantages which make them absolutely undesirable. Ethyl ether relieves pain, but when complete relief is obtained there is total muscular relaxation. In obstetrics this means inhibition of uterine contraction. Ether is absorbed through the alveolar lung surface with moderate rapidity and is excreted through the lungs slowly. It embarrasses foetal respiration to some extent, and therefore is not safe when used for a considerable length of time as the child will be born anæsthetized and its resuscitation will be difficult. Ether is irritating to the kidney tissue and quite unsuitable in the presence of organic renal disease of the mother and the more severe forms of toxæmia. In a large percentage of cases also it causes nausea and vomiting.

Chloroform is much more easily absorbed and is excreted with much greater rapidity than ether. It is therefore preferable for intermittent anæsthesia. It is more pleasant to take and rarely causes nausea or vomiting. As the margin of safety between the stage of anæsthesia and respiratory paralysis is very small, however, the administration of this anæsthetic is to be entrusted only to a careful, painstaking expert anæsthetist. Chloroform is equally dangerous to the foetus and the mother, and the danger is sufficient to forbid its general use.

Nitrous oxide gas relieves pain without inhibiting the force of uterine contractions. In fact, the results of experimental research indicate that the gas stimulates smooth muscle to contract and therefore increases uterine activity and shortens labor. It is very quickly absorbed and is as rapidly excreted as the expiration rate allows. It rarely produces nausea or vomiting. When combined with air, or better, with pure oxygen, it can be given either continuously or intermittently over a long period of time without harm to either the mother or the foetus. Recently a simple and highly satisfactory device has been developed which permits self-administration by the patient with perfect safety. This self-administration is of great importance as, after all, the patient herself knows the degree of pain better than any observer and is therefore the best judge of how much relief is needed. Nitrous oxide can be given from the first pain of the first stage of labor to the last pain of the second stage. It is equally available for immediate repair of the perineum, manual detachment, or the Credé manœuvre in cases of placental adherence. For extensive operative work, such as version, forceps or breech extraction, it is practical when given by an assistant.

Morphine, scopolamine, chloral, and drugs of a similar nature have been used alone and in combination. They have one serious disadvantage: once given, their rate of absorption varies with different patients and their rate of excretion is equally uncertain. These drugs are of value, of course, as drugs, but not as anæsthetics. They



have a temporary anodyne effect when the progress of labor is slow and the patient is becoming exhausted by her efforts, and in such cases the temporary rest will allow her to recuperate her powers.

The author believes that when properly given with oxygen and perfectly working apparatus, and supplemented with ether in selected cases, nitrous oxide can be administered in 99 per cent of all obstetrical cases so as to render the labor practically painless. The expense is much less than is commonly supposed and from the purely technical point of view nervous strain and often true shock are prevented and the general management of the case is facilitated.

C. H. DAVIS.

**Wormser, E.: Puncture of the Uterus in Hydramnion** (Ueber Punktion der Uterus bei Hydramnion). *Zentralbl. f. Gynaek.*, 1920, xlv, 137.

In the case reported there was a history of foetal death during the last half of several pregnancies which were associated with hydramnion. The only living child was born during the sixth pregnancy which was not associated with hydramnion. Believing, therefore, that there must be some relationship between the foetal deaths and the hydramnion the author resorted to puncture of the uterus in a subsequent pregnancy in which hydramnion developed. It was planned to repeat this procedure as often as seemed necessary until a living child could be delivered either by premature labor or labor at term.

The puncture was made with a trocar a little below and to the right of the umbilicus at about the middle of the sixth month of the pregnancy. Altogether 1,600 ccm. of clear amniotic fluid were withdrawn. The uterus was reduced about 3 cm. in size. The foetal heart tones could not be heard either before or after the puncture but the patient felt slight movements of the child. Six days later the foetal movements ceased and the uterus became tense. During the next four weeks there was no change and no foetal movements or heart tones could be distinguished. Rupture of the membranes occurred suddenly, being followed a few hours later by the delivery of a macerated child with definite hydrocephalus. Lues was positively excluded in this case.

The author believes the procedure described is harmless and worthy of further trial.

L. A. JUHNKE.

**Halsted, H.: An Analysis of Fifty-Six Cases of Breech Presentation; Description of a Method of Delivery in Which Manual Extraction of the Extended Arms Is Rarely Necessary.** *J. Am. M. Ass.*, 1920, lxxiv, 796.

Until the breech delivers from the vulva, the procedure is the same as in any other breech delivery. As soon as the breech delivers, the child is covered with a warm wet towel, and gentle traction is made downward and backward, assisted by pressure from above until the umbilicus is delivered. A loop of

the cord is then pulled down, the child is grasped about the pelvic girdle, and strong traction is made downward and backward. The bisacromial diameter of the body is kept in the antero-posterior diameter of the maternal pelvis until the anterior scapula is seen to slip under the symphysis. At this point it is very easy to deliver the anterior arm from the vagina. The child's body is lifted over the mother's abdomen, whereupon the posterior arm will slip out. The occiput is allowed to rotate under the symphysis, and the body to go with it. The Smellie-Veit manoeuvre is then used.

Before traction is made from below, an assistant makes firm pressure on the child from above and this is continued until the child's mouth is delivered. It is made in such a manner that the head will remain flexed on the chest and the arms will not extend.

In the series of cases reported there were 9 stillbirths. While they remained under the author's care there were no deaths among the babies that were born alive. Fourteen of the mothers were primiparæ and 42 multiparæ. Among the latter were 9 secundiparæ, 9 teriparæ, 6 quadriparæ, 9 quintiparæ, 2 sextiparæ, 2 septiparæ, 2 octiparæ, 1, nonipara, 1 decipara, and 1 undecipara.

The ages of the mothers ranged from 18 to 44 years. The age did not seem to have any influence on either the frequency or the ease of delivery.

The weight of the living babies varied from 3 lb., 8 oz., to 10 lbs., while that of the stillborn babies ranged from 3 lb. (a macerated premature baby) to 11 lb., 11 oz.

No craniotomy was done on an after-coming head, and the forceps were never applied to either the head or the breech, although frequently they were held in readiness.

The longest labor in the series lasted thirty-three hours and fifteen minutes. The shortest labor was two hours and fifteen minutes. The average length of labor was seventeen hours and four minutes among the primigravidæ and nine hours and eight minutes among the multigravidæ.

Among the primigravidæ there were 6 lacerations of the perineum of first degree, 2 of the second degree, and 1 of the third degree. Among the multigravidæ there were 4 of the first degree and 1 of the second degree.

One baby was a monster. Two had club feet, and one of these had also spina bifida.

EDWARD L. CORNELL.

**Lackie, J. L.: Artificial Rotation of the Head in Persistent Occipitoposterior Cases.** *Edinburgh M. J.*, 1920, n.s. xxiv, 168.

The first essential in the proper management of the occipitoposterior position is an absolutely accurate diagnosis. Usually this can be made from the ordinary signs, but in cases of doubt anæsthesia should be induced even in the first stage of labor and a manual examination made with several fingers or even the whole hand in the vagina. Only when the

progress is not satisfactory is interference recommended. If it becomes necessary the author gives an anæsthetic, completes the dilatation of the os manually, ruptures the membranes, and with the fingers reaching a shoulder rotates the whole child and places the vertex in the R.O.A. or L.O.A. position. Delivery is effected with the forceps after a short time has been allowed for the moulding of the head.

If the position is not diagnosed until the second stage of labor when the liquor amnii has escaped and the head has become more or less fixed at the brim or in the pelvic cavity, the hand is introduced into the vagina, the head pushed back, and the child rotated as before. If this is impossible the head is grasped with the right hand and rotated to an anterior position while, with the left hand acting through the abdominal wall, an attempt is made to rotate the shoulders. If the shoulders cannot be rotated it is difficult to keep the head in the anterior position and an attempt must be made to fix it with the right hand while the forceps are applied with the left hand. If this manipulation fails, rotation can be accomplished safely by means of the forceps applied in the usual way.

The cases most suitable for the method described are those in which the head is through the brim, in the cavity of the pelvis or on the pelvic floor, for then only can the forceps handles be carried around in the necessarily large circle. When the rotation is complete the forceps are removed and re-applied. In this manœuvre it is most important that there should be no traction during the rotation.

Two illustrative case reports are given to show that all possible means should be tried to rectify the malposition before resort is had to force.

C. D. HAUCH.

#### PUERPERIUM AND ITS COMPLICATIONS

**Gauss, C. J.: The Isolated Compression of the Aorta, a Prompt, Effective, Painless, and Safe Method of Stopping Hæmorrhage in Obstetrical Practice** (Die isolierte Aortencompression ist eine prompt, sicher, schmerz- und gefahrlose wirkende Methode der geburtshilflichen Blutstillung). *Zentralbl. f. Gynaek.*, 1920, xlv, 10.

The author advocates the direct compression of the aorta in cases of postpartum hæmorrhage instead of compression with the Momberg tourniquet. The Momberg tourniquet compresses all the abdominal viscera, is not always successful, and may cause injury. The isolated compression of the aorta produces an ischæmia of the extremities and pelvic structures which makes it of value in all cases of severe hæmorrhage. To obtain such compression the author uses his own aortic clamp or that devised by Sehr.

Chief among the advantages of the method described is the fact that the aorta is compressed at a point above the origin of the ovarian artery. Moreover, as the vena cava is not compressed, the

ischæmia is produced in the lower extremities and pelvic structures. In the uterus itself an absolute ischæmia is produced which permits the suturing of lacerations and the ligation of the vessels. The ischæmia causes prompt, powerful, and lasting contractions of the uterus. Even if the hæmorrhage occurs before the expulsion of the placenta there is no cause for alarm as the placenta will be expelled by the powerful contractions induced. For the same reason it is not necessary to do a manual removal in cases of adherent placenta.

The author cites numerous instances in which the method was used successfully in his own clinics and those of others.

L. A. JUHNKE.

#### NEW-BORN

**Sinclair, J. F.: The Problem of the Premature Infant.** *Arch. Pediat.*, 1920, xxxvii, 139.

The first problem which presents itself is the maintenance of the body heat. The child must not be chilled at birth. Immediately after birth it should be removed to a hot room (80 to 85 degrees F.) where it should be cleaned and anointed with warmed olive oil. This process must be done as rapidly as possible and the child wrapped in a warmed blanket and placed in a crib.

The crib for the premature infant may be made of a 24-in. clothes basket padded at the bottom with a layer of non-absorbent cotton to the depth of 8 in. Over the cotton fit a sheet of oil-cloth and stitch its edges to the basket. On the oil-cloth lay a small flannel blanket doubled on itself, and on the blanket place a pad of absorbent cotton to serve as the napkin on which the child's buttocks are placed. Line the sides of the basket with pads or blankets. Half a dozen citrate of magnesia bottles with wire and rubber corks, filled with water at 110 degrees F. and covered with flannel, should be hung on the inside of the basket.

The thermometer in the crib should be kept at as even a temperature as possible, for varying temperatures are prejudicial to the child's welfare. The best guide to the degree of heat needed in the crib is the child's temperature chart.

Another equally important problem in the care of the premature infant is that of the nutrition, and this is usually much more difficult to solve. The needs of the premature child are greater than those of a child born at term, but its powers of digestion are markedly less.

The prognosis depends largely on the child's weight and length and the cause of the prematurity, the weight being the most important factor.

Premature infants should be fed with breast milk, either that of the mother or that of a wet nurse. Usually the premature baby is too weak to nurse at the breast or feed from the bottle, and the milk must be given with a Breck feeder or by gavage.

In the beginning the proportion of one-half breast milk and one-half whey should be used. If the Breck feeder is employed, from  $\frac{1}{2}$  to 1 oz. may



be given every two hours. If gavage is used, the same amount or slightly more may be given, but at three- or four-hour intervals. Later the dilution of the breast milk may be gradually lessened until the infant is able to digest it without dilution. The quantity given at each feeding should also be gradually increased and the period between feedings extended until 2 oz. is given every three hours. Feeding with modified cow's milk is possible, but should be avoided unless breast milk is not obtainable.

A liberal supply of body fluids should be maintained under all circumstances. This may make necessary the use of normal salt solution subcutaneously, or better intraperitoneally or into the longitudinal sinus. For injections into the longitudinal sinus a 5 per cent glucose solution may also be given with advantage.

The lessened immunity of the premature infant as evidenced by its extreme susceptibility to infections of the respiratory and gastro-intestinal tracts as well as to those of the skin, and its liability to general sepsis is probably due to a smaller quantity of immune substances in its body or the immaturity of the organs which manufacture them.

Anæmia is usually present in a greater or less degree in all premature infants and is due to an insufficient deposit of iron in the body. The condition calls for the administration of iron, preferably in the food, as early as possible.

For the treatment of rickets, phosphorus, calcium, and cod-liver oil should be given as soon as they are tolerated.

EDWARD L. CORNELL.

**Mitchell, G. A.: The Newer Knowledge of the New-Born.** *Arch. Pediat.*, 1920, xxxvii, 151.

A large percentage of infants die in the first weeks of life. Most of these deaths can be attributed to premature birth, congenital malformation, congenital or inherited disease, injury at birth, or "congenital debility."

As it has been variously estimated that from 60 to 75 per cent of the deaths of infants under 1 month of age are due to prenatal causes, much interest has been stimulated in prenatal care.

It is evident that the new-born infant must combat not only diseases peculiar to the first few weeks of life, but also occasionally those that commonly affect older children.

The new-born child must digest and assimilate fat, sugar, and protein, and under normal conditions the necessary ferments to prepare these food-elements for absorption are present in the gastrointestinal canal.

Many of the reported examinations of the blood in the new-born have been in reality analyses of the blood taken from the cord at birth, and as such represent the condition of the blood of the fœtus rather than that of the new-born infant.

Determinations of the blood sugar have shown that the reduction power of the blood of the new-born is essentially the same as that of the adult and of older children.

At birth there are 3.0 mg. of uric acid per 100 gm. of blood. A maximum of 3.9 mg. is reached by the third day. The quantity then falls off slowly to 2.9 mg. on the fifth day, and then decreases rapidly, reaching 1.6 mg. between the eighth and eleventh days.

In 9 cases in which the fat from the umbilical vein was determined the quantity varied from 0.14 to 0.49 per cent and averaged 0.27 per cent.

It is apparent that at least during the first ten days of life infants do not require the 100 calories per kilogram of body weight which the older writers claimed were necessary.

In deciding whether or not an infant should be fed in the first few days of life it should be borne in mind that the new-born infant requires 60 calories per kilogram of weight every twenty-four hours and in the secretion from the breast he receives only a fraction of such an amount, not enough to supply the energy requirements for combustion alone. Further, that there is considerable loss of water from the child's body and a consequent concentration of the blood. The higher the percentage of water the easier the processes of metabolism. When the glycogen in the liver and tissues has been used up (as it is within a few hours after birth) it is necessary for the child to use its own tissues to supply energy. Although it is certain that the mechanical loss of weight cannot be entirely prevented, it seems logical, in view of these facts, to supply the new-born infant with water or easily digested food of some caloric value. In spite of this, some authors advocate giving nothing until the breast milk comes in and believe that artificial feeding at this time prolongs and increases the loss of weight.

The feeding of cow's milk to the new-born infant, however, means introducing a foreign protein which may be absorbed directly into the blood. Therefore the best procedure is to give breast milk from a healthy woman which has been diluted with boiled water.

When breast milk is not obtainable, 5 per cent lactose solution should be used. The weaker and smaller the infant the more it requires early feeding.

EDWARD L. CORNELL.

**Bradley, W. N.: Feeding the New-Born.** *Arch. Pediat.*, 1920, xxxvii, 144.

The preparation of the mother for the performance of the function of nursing the new-born infant is a vital part of the prenatal care. With few exceptions, every mother can nurse her baby if she so desires.

The statistics of the Starr Center show that in the year 1912-1913 only 48 per cent of the babies under care were breast fed. After six years of insistence upon breast feeding, the statistics of the last fiscal year show that of 92 babies whose mothers had been cared for by the Prenatal Department, 90 were entirely breast fed at 1 month of age, 1 partially breast fed, and 1 bottle fed.

Attempts at maternal nursing should never be abandoned because of the delayed appearance of the milk, failure of supply due to nervous influences or shock, or an upset condition in the baby. In all such cases a little patience and encouragement will usually be successful.

The quality, quantity, and character of breast milk are all influenced by the habits of the mother. Special attention should be given therefore to her mode of living.

As soon after delivery as the mother's condition will permit the baby should be put to the breast for a period of ten minutes. This should be repeated every four hours until the appearance of the milk supply. After that, the child should nurse every three hours for from fifteen to twenty minutes and once at night.

The chief signs of disturbed digestion in the early weeks of life are regurgitation, vomiting, colic, undigested bowel movements, failure to gain, or actual loss in weight. All of these signs should be investigated to ascertain the exact cause of the disturbance. A chemical examination of the breast milk at the outset often aids in detecting the source of the trouble. A moderate degree of regurgitation in the breast-fed baby may be considered physiological, as in some instances no limit is put on the length of time the child is allowed to nurse and it gets too much.

Intercurrent disease of a transient nature in the mother is not sufficient cause for weaning the child. Temporarily it may be given a substitute mixture, measures being taken to retain the mother's supply of milk until it is possible to return the child to the breast.

Galactogogues have been proven worthless. Hess believes that massage and steaming of the breasts are of decided value in improving the milk supply.

If weaning becomes necessary, a wet-nurse should be obtained. If this is impossible, artificial feeding is the only alternative.

During the first few weeks of life the child which is artificially fed should be given highly diluted and boiled cow's milk to which less sugar has been added than for older infants. While a highly diluted formula gives a lower caloric value than will meet the infant's requirements, it is important to begin with a dilution not greater than one-sixth to one-fifth of whole milk and to strengthen the formula gradually in order to accustom the infant's digestion to the food.

EDWARD L. CORNELL.

#### MISCELLANEOUS

Eden, T. W.: *Discussion of the Report on the Teaching of Obstetrics and Gynecology.* *Proc. Roy. Soc. Med.*, Lond., 1920, xiii, Sect. Obst. & Gynec., 39.

Under present arrangements medical students in London attend their cases in three different ways: (1) in a maternity district of their own hospital;

(2) partly in the midwifery ward and partly in the district; and (3) in a lying-in hospital alone.

The great majority come under the first heading. Practically all such students begin their cases in the district without ever having seen a woman delivered in a lying-in hospital, a maternity ward, or elsewhere, and without having received any clinical instruction in the conduct of labor. During their attendance on their cases they have no supervision and no practical assistance of any kind, even in the management of the infant, a subject of which they are profoundly ignorant. Students trained in this way therefore gain their first ideas of the conduct of labor under the muddled, makeshift, unsanitary conditions usually found in the homes of the poor. They have no hospital standard by which to correct it for they have never seen labor conducted under hospital conditions. What wonder if they conclude that strict surgical cleanliness and careful precautionary measures are unnecessary in midwifery!

The case of the student who goes first to the midwifery ward is much better. Here he sees labor properly conducted under hospital conditions before he begins his work in the district and receives a certain amount of clinical instruction. Unfortunately, very few students have this training, as only four teaching hospitals in London at the present time have a midwifery ward for such instruction.

Some students go only to a lying-in hospital because of the fact that, owing to the nature of their location, certain hospitals have only a small maternity district and are unable to provide all their students with 20 cases. Students go to a lying-in hospital where they can get "signed up" in from fourteen to twenty-one days as having attended 20 labors. In addition, they see a certain number of abnormal cases and gain a certain amount of clinical instruction from the visiting physicians on their rounds. They do not attend cases in the district at all.

There is no doubt that on the whole the training of London medical students is really bad. Nothing more unsuitable than the district conditions could possibly be devised for their training, and it must be admitted that the unsatisfactory results of midwifery practice in general are largely the result of poor training.

The actual mortality is not the only point. We all know how much chronic ill health and disability to perform work result from the minor infections of labor which are not attended by any mortality. The out-patient departments of the hospitals are thronged with such cases. The economic value of female labor to the State is very great, and the loss from these illnesses of national importance. A further frequent late result of minor infections is sterility, which has a bearing also on the national birth-rate. The conclusion drawn from these facts is that the general level of midwifery practice is low and should be raised without delay. Medical practitioners are not entirely to blame as 40 per cent of the confine-



ments in the United Kingdom are attended by midwives. Much of the responsibility, however, rests with the medical profession.

In their investigation upon the teaching of obstetrics and gynecology the Committee of the Royal Society of Medicine of London became convinced that present conditions are such that only drastic and far-reaching changes will suffice and that it is of no use to tinker with the present system. It is obvious that the amount of time allotted in the curriculum to midwifery and gynecology is quite inadequate and should be greatly increased. The Committee therefore suggested that four months should be devoted to these subjects alone.

The next conclusion of the Committee was that proper training in practical midwifery can be given only in a hospital. The management of normal labor is perhaps the most important single clinical subject of the curriculum for the young practitioner as soon as he begins practice gets more of this work than any other. The management of normal labor must be taught as a surgical procedure, under proper conditions, and this can be done only in a hospital.

Further, it was concluded that midwifery training should be extended in both directions, i.e., so as to afford a more extensive study of pregnancy, by means of the ante-natal clinics, and a fuller training in the management of the infant, through the infant-welfare clinics. The conclusion was drawn also that the senior teachers of obstetrics should take a very much larger share in the practical teaching than they do at present. The share they now take is very small and compares unfavorably with what is done by instructors in medicine and surgery.

In considering whether these principles could be put into practice in existing institutions it was decided that the lying-in hospitals would not be satisfactory.

The next alternative is the midwifery ward of the general hospital. This ward should have a minimum of 75 beds, 50 for midwifery cases and 25 for gynecology. The students should be in residence, at any rate for a part of their training, for if not in residence they will never see the night cases and will lose a great many opportunities.

An objection to this scheme is that only the largest hospitals could give up the required number of beds—probably not more than 4 of them—and that to meet the needs of all the London students at least 6 such departments would be necessary. An alternative is therefore necessary. Such an alternative is suggested in the formation of institutions for women of a type new to London but similar to the Rotunda Hospital in Dublin. These institutions, called "centers" would be for the reception of pregnant women, women in labor, lying-in women, nursing women with their infants, and the ordinary run of gynecological cases. They should be organized to provide ample training for medical students and graduates and facilities for research.

Such an institution should be a large one, containing about 200 beds, 140 for midwifery and 60

for gynecology. Its staff should be entirely a resident staff and well paid. There should be a resident director in charge of the clinical work, the laboratory work, and the teaching. Under him should be 2 assistant directors and under them a staff of resident assistants. The students should be in residence for a part of their training and attached to the institution for four months.

The centers could be arranged in parts of London where there is urgent public need for increased midwifery service. In 1915 the Local Government Board issued a report on the maternal mortality of childbirth in the United Kingdom. A study of this report shows that the death rate is highest in districts in which hospital accommodation is least and lowest in districts in which it is greatest. There is therefore every reason to believe that the establishment of a greater number of maternity hospitals would very greatly decrease the mortality in connection with childbirth.

Another advantage would be that ample clinical material would be provided for training students and junior practitioners.

The system by which all the teachers would be in residence would enable the senior teachers to take their proper share in practical teaching, which they cannot do at present, and would offer them scope for clinical work and research worthy of the very best men.

C. H. DAVIS.

**Barrett, Spencer, H., and Williamson, H.: A Criticism of the Report of the Committee of the Council of the Section of Obstetrics and Gynecology of the Royal Society of Medicine upon the Teaching of Obstetrics and Gynecology in London.** *Proc. Roy. Soc. Med.*, Lond., 1920, xiii, Sect. Obst. & Gynæc., 47.

The ultimate goal of the Committee is a system of education based upon two essential principles:

1. The establishment of large centers devoted solely to the study of obstetrics and gynecology and not forming part of a general hospital or medical school.

2. The provision of extensive clinical material.

The authors believe these two principles are incorrect. In their opinion the obstetrical and gynecological clinic should be part and parcel of a general hospital and medical school. Close co-operation between the gynecologist, the pathologist, the surgeon, and the physician is essential and such co-operation is possible only when the obstetrical clinic forms part of a general hospital both geographically and constitutionally.

The authors do not regard extensive clinical material as essential for the education of the student. The clinic need not be a large one. The minimum requirements are: (1) an out-patient pre-maternity clinic; (2) a few (say 6) pre-maternity beds; (3) a lying-in ward of not less than 20 beds; (4) a few (say 4) beds for septic cases; (5) an out-patient maternity district adequately supervised; (6) an infants' welfare center, pref-

erably a branch of the children's department; (7) a gynecological ward of 25 or 30 beds with an operating table; (8) a well-equipped clinical laboratory; and (9) a room for storage and investigation of morbid anatomical material.

The staff of such a clinic should consist of:

1. Three visiting obstetricians, all of whom should teach both obstetrics and gynecology.
2. A resident officer of the standing of a resident assistant surgeon or physician who should hold office for a period of not less than three years and be held responsible, under the direction of the visiting staff, for the practical instruction of the students in the lying-in ward and for the direction of the pathological work of the clinic. This officer should receive a salary of not less than £500 per annum.
3. A registrar and tutor.
4. Two resident officers of the standing of house physicians or house surgeons.

This system would offer many advantages to the student, the school, and the public over that of the whole-time officer proposed by the Committee.

Obstetrics and gynecology should be taught as one subject by the same teachers, and the student's studies in the two branches should be carried on simultaneously.

The clinic should remain essentially a part of the general hospital and the whole course in obstetrics and gynecology given in one school.

Every medical school should have its own lying-in ward.

C. H. DAVIS.

**Norris, C. C., and Rothschild, N. S.: Pennsylvania State Prenatal and Postnatal Clinic at the Henry Phipps Institute in Philadelphia, a Brief Report of the Work Done During the Past Year.** *Pennsylvania M. J.*, 1920, xxiii, 338.

As soon as the patient registers at the Pennsylvania State Prenatal and Postnatal Clinic at the Henry Phipps Institute in Philadelphia she is given a pelvic examination. If the diagnosis of pregnancy is confirmed, measurements are taken and as early in pregnancy as possible a diagnosis of the presentation is made. Blood is obtained for a Wassermann examination. If the patient is not in good condition and if she presents any symptoms suggestive of disease, she is referred to the proper clinic for a thorough examination of the chest, heart, lungs, throat, or nose as may seem desirable.

Within a few days the patient is visited at her home by the social service worker. At this visit the

blood pressure is taken and a specimen of the urine is obtained. The patient is verbally instructed as to the hygiene of pregnancy and printed instructions on this subject are left with her.

As a rule arrangements are made for delivery in one of the maternity hospitals.

Toward the end of the pregnancy a course of instruction regarding the care of the child is begun. In this, emphasis is laid upon keeping the infant well rather than upon its care during illness, though the latter is by no means omitted.

When the mother and child are to be discharged from the hospital the Prenatal Clinic is notified and a social service worker routinely visits these patients within a day or two at their homes. At this visit the mother is instructed to return to the Clinic for examination. In a normal case the final pelvic examination is given six or eight weeks after delivery. If lacerations are found, arrangements are made for their repair either immediately or, more often, at some later date.

In the first visit to the patient after her return from the maternity hospital or after her delivery in her home the social service worker arranges for the mother to bring the child to the Prophylactic Clinic at the Phipps Institute. This is a very important branch of the clinic. At this visit the child is weighed and further instructions are given the mother regarding the clothing, nursing, bathing, and general care of the infant.

The mother is told also to report at once to the Sick Infant's Clinic if the child does not progress well.

These two clinics, the Prophylactic and the Sick Infant's Clinics, are held on the same day, the one following the other. An endeavor is made, however, to keep the well children from coming in contact with those which are sick. The same physicians have charge of both clinics, an arrangement which greatly facilitates the work.

The social service worker visits the patient at her home and sees that the instructions are properly carried out.

The personal element, especially as regards the social service worker, is of the utmost importance and in fact the keynote of success. No routine of the sort described can be carried out without a good social service worker, and it is on her and her stability, efficiency, tactfulness, and common sense that the work will stand or fall.

EDWARD L. CORNELL.



# GENITO-URINARY SURGERY

## ADRENAL, KIDNEY, AND URETER

**Braasch, W. F.:** Recent Advance in the Diagnosis of Surgical Lesions of the Kidney. *Minnesota Med.*, 1920, iii, 112.

In roentgenography of the urinary tract sodium bromide as suggested by Weld is an ideal opaque medium and takes the place of the salts of colloidal silver and sodium iodide. Pyelography has added greatly to the accuracy of diagnosis, especially in the differentiation of renal calculi and gall-stones. The pyelographic data differentiating intra- from extra-renal lesions are: (1) the distance separating the shadow from the pelvis, (2) the exact relation of the shadow to the pelvis and (3) the presence of pathologic changes in the pelvic outline. Tuberculous renal caseation may simulate lithiasis.

The shadows seen in renal tuberculosis are of three types: (1) small scattered areas due to the deposit of lime in the calices, (2) larger shadows of irregular density, some of which may assume the characteristics of renal stone, and (3) casts of a portion or even of the whole caseated kidney.

Pyelography aids in the exact localization of a stone within the kidney, whether it is situated in the pelvis, a calyx, or the cortex. The fluoroscopic examination of the kidney at the operating table, as recently developed at the Mayo Clinic, will detect stones or fragments which remain after lithotomy.

Renal functional tests may be divided into tests of excretion and tests of retention. Among the tests of excretion the phenolsulphonephthalein test is the most favored and may be employed in the combined or the differentiated method. In the combined method 1 ccm. of phenolsulphonephthalein is injected intramuscularly and an estimation is made of the dye secreted by both kidneys in the two hours following its appearance in the urine. In this test two types of errors may arise: errors in technique and errors in interpretation. The technical errors may be such as: (1) the introduction of an excessive or insufficient amount of phenolsulphonephthalein into the syringe for injection, (2) the loss of a portion of the phenolsulphonephthalein solution from the syringe or needle at the time of the injection, (3) abbreviation or extension of the two-hour period of collection on the part of the patient, (4) loss of part of the urine collected during its transference to the receptacle from which the estimate is to be made, (5) retention in the bladder of a portion of the urine secreted, either because of a pathologic condition or misunderstanding on the part of the patient, (6) error in laboratory technique, such as insufficient alkalization, inefficient interpretation of color values, etc., and (7) clerical errors.

A case in which the function is less than 30 per cent should be studied carefully before operation. The possibility of the presence of retained urine at the time of the test should be borne in mind. Retention may be due to some condition of the prostate, a diverticulum, sacculation of a ureter, or hydro-nephrosis. The reflex irritation from stone may cause a lowering of function which will be recovered after the removal of the stone.

When in the presence of clinical or X-ray evidence of a decrease in one kidney the combined phenolsulphonephthalein test is normal it cannot be assumed that the other kidney is normal as the combined test will be normal even in the presence of bilateral tuberculosis, bilateral renal lithiasis, and polycystic kidney.

The differential functional test is the estimation of the phenolsulphonephthalein excreted by each kidney separately. A ureteral catheter is placed in each ureter and the dye injected intravenously. If the kidney is normal it will secrete from 15 to 30 per cent of the dye.

Hypersecretion in nervous patients or hyposecretion caused by reflex inhibition of secretion by the catheter may alter the results. The return flow along the ureteral catheter, if not allowed for, will cause an error. Peterson has suggested collecting 25 ccm. of urine from each ureter and making a relative comparison.

Methylene blue and indigo-carmin are valuable excretory tests. Thomas has developed a method for the quantitative determination of the blue test. These tests may be made at the same time as the phenolsulphonephthalein test.

The retention tests have been advanced by the estimation of the uric acid, urea, and creatinin in the blood by Folin and Denis, Marshall, Meyers, and Fine. Forty milligrams of urea nitrogen for each 100 ccm. of blood should indicate a guarded prognosis, while 100 mg. gives a grave prognosis. A determination of 2.5 mg. of creatinin in the blood indicates renal disease, while amounts of 5 mg. or more indicate an early fatal termination.

Cabot and Crabtree believe that the clinical course of an infectious renal lesion depends on the type of the infecting organism, the coccus group locating in the glomeruli and the colon group in the tubules and pelvis of the kidney. According to Sweet, Eisendrath, and others, urinary infection occurs by the lymphatic route, while Cabot and Crabtree believe it to be always hæmatogenous. The possibility of absorption from the renal pelvis has been demonstrated by Burns and Weld.

More recently symptomless unilateral hæmaturia has been regarded as the result of an insidious, chronic infection of the renal papillæ.

In conclusion the use of the wax-tipped catheter as advanced by Kelly to detect urinary stone is advocated, and the wide strictures or infiltration of the ureteral wall described by Hunner are discussed.

J. A. H. MAGOUN, JR.

**Danforth, W. C.: Infections of the Kidney in Gynecological Practice.** *Surg., Gynec. & Obst.*, 1920, xxx, 284.

During the past fifteen months in his gynecological practice the author has treated 25 cases of pyelitis, 3 cases of pyonephrosis, 1 case of obstruction of a ureter due to an aberrant renal artery, 2 cases of renal tuberculosis, and 1 case of pyelitis associated with imperforate vagina and absence of the uterus. In 23 of the cases of pyelitis the condition was due to the bacillus coli; in 1, to pneumococci; and in 1, to staphylococci. The article contains a number of interesting case reports.

Renal infections are about four or five times as frequent in the female as in the male, and when the incidence of pyelitis in pregnancy is considered, this ratio does not seem excessive. The author believes that in the study of the etiological factors of infections of the kidney not sufficient emphasis is laid upon infections of the urinary tract which occur in infancy. In the gynecological-obstetrical service of the Evanston Hospital, Evanston, Illinois, it has been made a routine practice to obtain specimens of urine from all infants in the ward service as soon as possible after birth. Danforth has done the same in his private practice for about two years. The frequency with which pus has been found in the urine has been striking. As a result of these investigations the author concludes that it is fair to assume that there are many unrecognized infections of the kidney in infancy which in later life may become serious. He suggests that a routine examination of the urine be made during the first week of life. The active routine treatment of urinary infections revealed thereby would be a valuable measure.

There are four possible routes by which infections may enter the kidney:

1. Through the lumen of the ureter. While this route is probably not followed frequently, it must be regarded as a possibility as cystograms show that fluid in the bladder may travel up the ureter, particularly if it is dilated, and radiograms often show a stone low in the ureter which at operation is found at a much higher level because of retrograde peristalsis.

2. Through the lymphatics and the wall of the ureter. By this route, however, infection through the lymphatics could scarcely travel the length of the ureter in an unbroken path, for if the lymphatics follow the ureteral blood vessels they would be apt to leave the wall of the ureter before arriving at the level of the kidney.

3. Through the lymphatic connection between the cæcum and the ascending colon. This is a route by which infections may pass directly from the bowel to the ureter. Certain French writers have suggested

that there may be some relationship between appendicitis and lesions of the right kidney.

4. The blood stream. As colon bacilli are always found in large numbers in the large bowel, they must be present at times, if not constantly, in the blood stream. Under normal conditions bacteria are excreted by the kidney without damage to the parenchyma, but when drainage from the kidney is obstructed or the bodily resistance is lowered, infection may occur. The frequency of pyelitis in pregnancy the author believes is explained by the pressure exerted on the ureter by the pregnant uterus. He is of the opinion also that many women pass through pregnancy with a mild infection of the kidney which escapes recognition.

Quoting Cabot and Crabtree, Danforth divides cases of non-tuberculous infections of the kidney into three classes: first, those due to bacilli of the colon group; second, those due to cocci; third, those of both coccal and bacillary origin. Appendicitis and pyelitis must be differentiated and an appendectomy performed during pregnancy should always be preceded by a microscopic examination of the urine.

In the author's experience lavage of the kidney is the best method of treatment. In mild pyelitis associated with severe cystitis, however, lavage of the kidney should not be attempted until the cystitis has been lessened. The bowels must be kept open and the patient given bacillus bulgaricus. The kidney should be irrigated at four-day intervals with silver nitrate solution varying from 1:300 to 1:100. The number of lavages required varies from one to six, and is usually three or four.

The practice of treating what appears to be a cystitis by medication by mouth or irrigation of the bladder cannot be too strongly condemned.

The criterion of cure is the absence of bacteria in one culture, or better, in two successive cultures, of the urine.

J. P. O'NEIL.

**Hutchinson, W.: Renal Calculus.** *Canadian M. Ass. J.*, 1920, x, 250.

The author gives a brief outline of the pathology, symptoms, physical signs, diagnosis, and treatment of renal calculus, and describes his method of removing renal calculi.

A renal calculus begins with a small deposit of salts in the kidney substance. It increases in size by the addition of more salts and becomes firmly embedded. Eventually it may break through the calyx, grow into the pelvis, or branch out and grow into an adjoining calyx. Occasionally it becomes loosened from its attachment and plugs up a calyx, thus producing the renal type of uronephrosis. This type of stone affects the kidney by: (1) direct pressure, (2) inflammatory reaction, and (3) the dissolving action of bacterial invasion.

In some of the author's cases there were no symptoms, and in many cases the only symptom was pain of a dull aching character in the loin. This was relieved by rest and was frequently diag-



nosed as lumbago. Hæmaturia was rarely observed. General disturbances were noted only in the late stages of the condition. The early signs were indefinite. Tenderness to pressure is usually posterior but may be anterior and cause confusion in the differential diagnosis from gall-stones. The urine may show a few pus and blood cells. In other cases it may be negative or full of pus. In the late stages enlargement of the kidney and severe inflammation are present.

An early diagnosis is necessary to prevent destruction of the kidney. The practitioner should be suspicious of every case of loin pain and have the patient examined by a competent urologist. The X-ray is almost infallible in the diagnosis of stone in the kidney. Ureteral catheterization, while of no diagnostic value, will prove the presence of a second kidney when nephrectomy is indicated.

Operation is the only cure for renal calculi. In the author's opinion all cases should be operated upon, even those in which there are no symptoms. He advises removal of the stone through the kidney substance rather than through the pelvis. He does not agree with Broedel that when the kidney is split longitudinally, just behind the midline, the pelvis may be entered without injury to the large branching vessels. In experiments on animals he found that the longitudinal incision required mattress sutures to control the bleeding, but that when the kidney was incised transversely only a few stitches were necessary. He observed also that after a few months, kidneys which were split longitudinally showed considerable infarction and were greatly reduced in size while those which had been split transversely showed only a small linear scar and were not reduced in size.

The author's technique for renal calculi is as follows:

The stone is located by the X-ray or, when necessary, by a pyelogram. The capsule is incised over the stone and the handle of a scalpel gently pushed through the kidney down to the stone. The stone is then removed with the forceps. If the calculus projects into the pelvis, the pelvis is opened.

The importance of the following points is emphasized:

1. Early and careful urological examination of all patients suffering with pain in the back in order that the diagnosis may be made early.
2. Double ureteral catheterization before operation.
3. The use of small transverse incisions instead of a longitudinal incision. G. J. THOMAS.

**Molla, R.: Clinical Considerations of Tumors of the Kidney, with a Report of Two Cases of Myxoma** (Consideraciones clinicas sobre los tumores del riñón con motivo de dos casos de mixomas). *Med. Ibera*, 1920, x, 113, 134.

Molla reviews the pathology and diagnosis of renal tumors and reports 2 cases of myxoma diag-

nosed by microscopic study. He concludes that renal myxomata are very rare and difficult or impossible to diagnose. In the few cases reported by others the diagnosis was not made until after operation.

In the first of the author's cases a diagnosis of hydatid cyst was made largely by exclusion and on the basis of the local signs, the patient's fair general condition, and the absence of definite symptoms. In the second case the symptoms resembled those of a chronic inflammatory process such as a retroperitoneal cold abscess of the vertebræ or the appendix. It is therefore evident that myxoma of the kidney may develop without giving rise to symptoms such as local or referred pain, hæmaturia, and pyuria.

A renal myxoma may become very large. Sarcoma in children may reach the same volume but is more rapid in growth and usually gives rise to urinary symptoms and clinical manifestations both local and general.

The absence of urinary symptoms in cases of renal myxoma is partially explained by the fact that there is usually mechanical obstruction without invasion of the ureter. Exclusion and spontaneous suppression of renal function in the affected kidney without involvement or insufficiency of the other kidney is common. Invasion by contiguity occurs only in the late stages when the intestines and lumbar tissues become involved. Diffuse metastasis by way of the blood stream is very exceptional.

A myxoma thus differs from a sarcoma not only clinically but anatomically. Sarcomata become generalized comparatively early.

In their location and size the tumors in the author's cases resembled tumors of the adrenal but the autopsy demonstrated their myxomatous nature and their primary origin in the kidney. They resembled also the sarcomatous tumors of infants described by Bland-Sutton, but the diagnosis of renal myxoma was confirmed by the ages of the patients, 35 and 27 years respectively, and the findings of the microscopic examination.

W. R. MEEKER.

**O'Connor, V. J.: Riedel's Lobe of the Liver Complicating Urological Diagnosis.** *J. Urol.*, 1920, iv, 97.

This paper is based upon 2 cases which were admitted to the urological service of Dr. Quimby at the Peter Bent Brigham Hospital and demonstrate the possibility of confusing this condition with lesions of the right kidney.

In both cases the diagnosis was verified by operation. In the first case the right kidney was exposed through the usual oblique incision and found normal. The final diagnosis was Riedel's lobe and bilateral pyelitis.

In the second case the condition was diagnosed before operation as hypernephroma. Both kidneys were normal. H. L. KRETSCHMER.

**O'Neil, R. F.: Observations on the Hæmaturia of Chronic Infectious Focal Nephritis.** *In. ernat., J. Surg.*, 1920, xxxiii, 72.

The terms "essential hæmaturia" and "idiopathic renal hæmaturia" should be limited to hæmaturia for which no cause can be found and to unilateral hæmaturia which is due supposedly to calculus, tuberculosis, or neoplasm, but in which cases at operation no gross pathology is discovered.

In the cases reviewed by the author there were often no lesions, but a certain number showed chronic nephritis. In O'Neil's opinion the relation of idiopathic hæmaturias to chronic nephritis is too constant to be a coincidence and the underlying cause is nephritis.

The chief point to be determined by the surgeon in the treatment of unilateral hæmaturia due to nephritis is whether the nephritis is of toxic or infectious origin.

Israel stated that unilateral nephritis may cause colic and hæmaturia, and may be severe without casts or albumin, and that bilateral nephritis may give rise to symptoms on one side only.

According to Rovsing, the urine may be infected in some cases of hæmaturia and in some instances infectious nephritis cannot be differentiated under the microscope from interstitial or toxic nephritis. Rovsing stated also that, unlike the toxic nephritis which is always bilateral, lymphatic infections may be limited to one kidney or a part of one kidney.

Chute divides cases of nephritis into three groups as regards the prognosis and treatment:

1. Cases of frankly toxic, chronic, and interstitial nephritis in which the urine is typical of diffuse interstitial or parenchymatous nephritis and in the majority of which the hæmaturia is unilateral. In these cases operation is not encouraging.

2. Cases of hæmaturia which is infectious at the time of bleeding as shown by the bacteriological examination of the urine.

3. Cases of chronic nephritis of infectious origin which has become non-infectious at the time of bleeding.

O'Neil doubts whether hæmaturia can come from a healthy kidney, and while agreeing with Keys that bleeding may be due to a ruptured renal varix or the vascular plexus at the apex of the papillæ, he is of the opinion that nephritis is the underlying cause. He admits that purpura gives rise to hæmaturia, but believes that the diagnosis should be confirmed by other evidence of the disease.

After considering the many probable sources of "renal symptomless hæmaturia" O'Neil states that the diagnosis will depend upon the care with which all causes of bleeding are eliminated. Such elimination calls for the clinical history, cystoscopy, ureteral catheterization, X-ray, pyelography, urinalysis, bacteriology, renal functional tests, and a physical examination.

The symptoms are generally bleeding from the kidney for a long time with very little discomfort, a feeling of heaviness, and a dull, aching pain on the

affected side or in the back which is not influenced by rest or motion, is occasionally colicky, and extends down the ureter. According to Rovsing, all of these are probably due to overdistention of the renal capsule. The urine usually contains blood and albumin and sometimes shows pus. Casts indicate a toxic nephritis, but according to Israel may be present between the attacks of bleeding.

When there is bleeding only, and when tuberculosis and calculus have been excluded, the exclusion of tumor may require operation although "essential hæmaturia" usually occurs earlier in life than a neoplasm.

In hæmaturia from chronic infectious focal nephritis nephrectomy is contra-indicated. Determine first that the hæmaturia is unilateral and then limit the operation to the freeing of adhesions, decapsulation and fixation, or nephrotomy. Decapsulation and nephrotomy have given equally good results, but decapsulation is the safer operation.

B. F. ROLLER.

#### BLADDER, URETHRA, AND PENIS

**Kolischer, G., and Eisenstaedt, J. S.: Complete Closure of the Urinary Bladder after Coagulation of Tumors.** *J. Am. M. Ass.*, 1920, lxxiv, 801.

It has always been a cause of regret to genitourinary surgeons that in most operations on the bladder it is impossible to finish the procedure at once because of the necessity or supposed necessity for tubal drainage. This was one of the main reasons for the treatment of bladder tumors by cystoscopic endovesical methods. Endovesical treatment includes fulguration, galvanocauterization, and diathermy.

In certain types of cases, however, open operation must be done. For these types the authors have perfected a method of completely closing the bladder which quite constantly ensures primary union even in the presence of vesical infection. The superiority of destroying vesical tumors by heat over excising them with the knife is becoming more generally appreciated by urologists.

The essential feature of the authors' method is the closing of the bladder wall with mattress sutures and inversion of the edges of the mucosa. This union is re-inforced by whipping over a simple continuous suture. Thorough subfascial drainage is obtained by inserting a narrow rubber tube under the fascia of the recti parallel with the incision and bringing its ends out at each end of the skin wound. The bladder is opened by suprapubic cystotomy in the usual manner, the tumor is freely exposed with retractors made of fiber or hard rubber, and the coagulation is thoroughly accomplished by the galvanocautery or diathermy. The bladder and abdominal wall are then closed completely except for the subfascial drainage.

After operation the patient may be able to urinate spontaneously. If not, he is catheterized at regular intervals. A permanent catheter is not used be-



cause of the associated danger of urethritis, vesical irritation, and ascending infection. If symptoms of cystitis are observed, 20 per cent argyrol is instilled into the bladder twice a day. The subfascial drainage tube is removed after twenty-four hours. The bladder and abdominal wound are usually entirely healed in seven or eight days. If malignancy is suspected or proven, radium or mesothorium is inserted into the bladder by means of a urethral carrier.

Whether this method and technique are applicable to extensive carcinomata involving the base of the bladder remains to be demonstrated by further experience.

J. P. O'NEIL.

### GENITAL ORGANS

**Soresi, A. L.: Prostatectomy.** *Internat. J. Surg.*, 1920, xxxiii, 49.

Soresi suggests the following procedures to facilitate the surgical treatment of enlargement of the prostate.

1. To prevent irritation of the skin shave the operative field and dry it with hot air. Then for a distance of about 3 cm. around the area where the incision is to be made rub the skin with ether and gauze and paint it with two or three coats of common rubber cement in about five parts of ether. To this area then apply firmly a dry sterile piece of sheet rubber (dentists' dam) of sufficient size to cover the upper third of the thighs and the abdomen up to the umbilicus. After this the incision may be made in the ordinary manner.

2. To prevent infection of the prevesical space suture the skin to the bladder and do not open the bladder until after adhesions have formed. In this suturing only the very edge of the skin and the subcutaneous connective tissue should be included in order that the scar may be very thin. Local anæsthesia should be used.

3. To prevent postoperative hæmorrhage apply to the bed of the prostate a rubber bag filled with mercury through which is a tunnel for drainage of the urine. Into the tunnel of the bag fit a catheter so that it passes through the entire bag and its tip reaches the bladder. If the catheter causes discomfort it may be easily withdrawn without disturbing the mercury and the mercury may be withdrawn or replaced at will.

T. F. FINEGAN.

**Singleton, A. O.: Reducing the Mortality in Prostatic Operations.** *Texas State J. M.*, 1920, xv, 403.

Singleton classifies the causes of death in prostatic operations in the order of their importance as follows: hæmorrhage, shock, and infection.

Uræmia as a cause may be eliminated by determining the power of the kidneys to withstand the operation. For this the phenolsulphonephthalein test is insufficient. This test is indispensable as a test of function but the power of the kidneys may be determined more accurately by estimating the

blood urea. The author cites cases of uræmic coma and death following prostatectomy in which the phenolsulphonephthalein excretion was normal, 50 per cent in the first two hours, but the blood urea was above normal, 90 mg. per 100 ccm. of blood. He will therefore no longer remove the prostate when the blood urea is high except to establish permanent suprapubic drainage. For estimating the blood urea the urease method is recommended.

The chances of both uræmia and infection are greatly reduced by performing the operation in two stages. Shock is reduced to a minimum by combined local and sacral anæsthesia. Nitrous oxide may be used in short operations although it increases hæmorrhage. Ether is definitely contra-indicated.

The principal steps in the author's technique are as follows: (1) a hypodermic of morphine and atropine; (2) an injection of 1 oz. of a 1 per cent solution of novocaine into the sacral canal with the patient lying on his right side; (3) irrigation of the bladder with a catheter with the patient on his back, 12 oz. being left in the bladder; (4) infiltration of the abdominal wall and bladder with a 25 per cent solution of novocaine; (5) infiltration of the prostate with adrenalin; (6) shelling out of the prostate with a gloved finger in the rectum and a bare finger through a suprapubic opening; (7) control of hæmorrhage with an Allen pack of gauze drawn into the prostatic cavity by means of a string through the urethra or with a Freeman pack of gauze packed in directly, to which the volsellum is left attached; (8) removal of half of the packing on the third day and the rest on the fourth day; and (9) daily irrigation of the bladder by way of the urethra and a suprapubic tube until the wound is healed.

B. F. ROLLER.

### MISCELLANEOUS

**Reinle, G. G., and DePuy, E. S.: Refinement of Colorimetric Methods with Special Reference to Indigo-Carmin as a Bladder Test.** *California State J. M.*, 1920, xviii, 49.

While accepting phenolsulphonephthalein as the most valuable single test of renal function, the authors point out certain disadvantages which they have found to arise when it is used in the customary manner. Employing the aqueous standard solution and a Hellige colorimeter, they discovered that their readings in a series of comparatively normal cases were constantly lower than the normals set by Rowntree and Geraghty which were based on readings made with the DuBosc colorimeter. An accurate comparison could not be made between diluted urine containing phthalein and an aqueous standard solution, especially when a transmitted light method was used as is the case when the Hellige apparatus is employed. A special instrument with reflected light as proposed by Peebles was therefore constructed and the results were much more accurate.

Using as a standard solution a mixture of an aqueous and a urine standard in the same proportions as the dilution of the fluid to be tested, i. e., the urine specimen diluted with water up to 1,000 ccm. and employing the reflected light method, it was found that the readings were from 10 to 25 per cent higher than those obtained by the old method (aqueous standard and transmitted light), the variation depending upon the amount of coloring matter in the urine tested.

To discover a method applicable to urine containing blood, the authors made a further investigation of the relative values of phloridzin, the iodide test, lactose, the polyuria test, methylene blue, rosaniline, etc., and concluded that all of these were inferior to indigo-carmin. Indigo-carmin they claim will give as accurate an estimation of renal function by colorimetry as phthalein, and they suggest its use as an alternative or supplement whether blood is present or not. The amount of blood which may destroy the value of the test is not stated. Owing to the fact that the dye reaches the height of its elimination within a few minutes after its appearance (three to five minutes), the specimens may be taken and readings made much more quickly than when phthalein is used. A disadvantage, however, lies in the instability of indigo-carmin which renders necessary the fresh preparation of the solution for intravenous injection and the standard solutions. The technique is described.

HORACE BINNEY.

**Stevens, A. R., and Peters, J. P.: Urinary Tract Purpura: A Probable Entity. *J. Urol.*, 1920, iv, 1.**

This paper is based upon a study of 37 cases which the authors observed in a period of eighteen months' work in France.

Two of the patients had had diphtheria; 2, rheumatic fever; 3, recurrent attacks of tonsillitis; 8, dyspnoea; and 4, recurrent respiratory infections. Only 3 had had attacks of gonorrhoea and these showed no residual signs of the disease.

As a rule, the onset of the urinary purpura was sudden and the condition was fully developed in forty-eight hours. In some cases the urinary symptoms were preceded by general symptoms such as headache, pain in the legs, malaise, giddiness, and weakness. The onset was characterized by marked prostration and malaise, headache, pain in the legs and back, gross hæmaturia, frequency and urgency of urination, dysuria, and pyrexia. These symptoms varied in the order of their appearance and their relative severity.

In patients who were admitted to the hospital during the febrile period the disease resembled an acute infection. The pains were of two types: those that seemed to be due to a general infection and those that were referable to the urinary tract.

The urinary pains varied from dull aching in the lumbar region and upper abdomen to acute pain or renal or vesical colic, and were usually associated with marked tenderness over the kidneys and bladder. In some cases dizziness and herpes labialis were present. As a rule the initial temperature was quite high. In every case in the early stages of the condition the urine contained gross blood.

In all but one case casts were found in the urine at some time. Usually they were of the hyaline and granular types, but in at least 17 cases epithelial and red blood casts were found.

Only one patient was discharged from the hospital with consistently negative urinary findings and without symptoms. In the majority of the cases the urine still showed a slight trace of albumin and casts when the patients were evacuated to England.

Definite diminution in the excretion of phenol-sulphonaphthalein was noted in all but 4 cases.

Cystoscopic examination showed essentially the same picture in every instance: multiple small hæmorrhages into the bladder mucosa not associated with ulceration, neoplasm, or calculus. Two cases showed congestion of the entire bladder wall. The number of hæmorrhages varied from two to over a hundred. The hæmorrhagic areas were irregular in shape and were noted chiefly in the posterior and lateral walls of the bladder. No hæmorrhagic spots were found adjoining the margin of a ureteral orifice. No blood was seen oozing from the bladder mucosa. When gross blood was present at the time of cystoscopy, blood was seen to come from both ureteral orifices. Endoscopy showed hæmorrhagic spots in the verumontanum.

The pressure of a definite renal lesion was indicated by the consistent presence of casts in the urine and the reduction of renal function as indicated by the phenolsulphonaphthalein test.

The disease described differs very essentially from the ordinary types of acute nephritis seen in civil life and among the cases in a general war hospital. The common symptoms of oedema or dyspnoea are almost entirely lacking. Other findings distinguishing it from the ordinary forms of urinary infection are the comparative absence of pus cells in the urine, the absence of leucocytic infiltration about the bladder lesions, and the consistently negative bacteriological findings. In many of its general manifestations the disease resembles trench fever.

The bladder hæmorrhages can not be distinguished at present from those of any other purpuric lesion, but a purpura of such frequent occurrence which, at least in a large proportion of cases, is limited to the urinary tract is sufficiently extraordinary to command attention.

The article is well illustrated and contains elaborately and carefully written protocols.

H. L. KRETSCHMER.



# SURGERY OF THE EYE AND EAR

## EYE

**Francis, L. M.: The Removal of Magnetic Foreign Bodies from the Vitreous.** *Arch. Ophthalm.*, 1920, xlix, 198.

In cases of magnetic foreign bodies in the vitreous Francis examines the eye carefully with the X-ray, making at least three, and possibly four, plates in order to determine not only the position but also the size and shape of the foreign body. Having made this diagnosis, he chooses the route and method of extraction in accordance with the findings. If the foreign body is small and round or nearly round and without jagged edges, he uses the anterior route, attempting to direct the body between the lens and the ciliary muscle and through the pupil into the anterior chamber. An exception are the cases in which the body is so situated that it may become impacted in the ciliary muscle upon exposure to the tractive force of a powerful magnet. In these and all other cases the posterior route is preferred.

In describing his operative procedure Francis emphasizes the necessity for using non-magnetic instruments as it is extremely difficult to control magnetic instruments near the magnet. A good artificial light in the hands of an intelligent assistant is also essential.

When the body in the vitreous is to be extracted by the anterior route the patient is placed before the magnet with the pupil dilated as much as possible and the eye cocaineized. He is then brought nearer the magnet and as soon as the foreign body can be seen bulging the iris forward, the direction of the pull of the magnet is immediately made oblique in order that the fragment may be brought through the pupil. After this has been done the patient is removed to the operating table and a keratome is inserted into the cornea perpendicularly, as close to the fragment as possible. The hand magnet is then used and, if necessary, a fine forceps.

For the removal of a foreign body by the posterior route a subconjunctival injection of cocaine and adrenalin is given. The scleral incision is made as near the foreign body as practicable without injury to the ciliary muscle, and the sclera is exposed by a bold stroke of the scissors made in an anteroposterior direction. Each of the two flaps of conjunctival and subconjunctival tissue so formed are caught with a double suture. The sutures are first used as retractors, and after the foreign body has been removed, as tractors, the lips of the scleral wound being approximated by tucking one flap under the other and covering the first with the second. The scleral wound is made in an anteroposterior direction and the magnet presented to the wound. Care is taken to trim off any choroid or vitreous

The after-treatment consists in the administration of 40 gr. daily of sodium salicylate. The sutures are removed in from six to eight days. T. D. ALLEN.

**Levin, I.: The Technique of Radium Application in Cataracts.** *Am. J. Roentgenol.*, 1920, n.s. vii, 107.

Levin points out the necessity for distinguishing between the various rays of radium and the importance of filtering out the alpha and soft beta rays because of their irritating effect on the conjunctiva and cornea. The hardest beta and gamma rays have a selective action on abnormal cells and a penetrating action not possessed by the soft rays.

Levin uses about 25 mg. of the element in a brass capsule 1 mm. thick which is covered with black photographic paper to a thickness of 2 cm. and a layer of gauze also 2 cm. thick. This is placed over the closed eyelid for two hours; at first weekly, and later at longer intervals, depending on the progress being made as determined by ophthalmological examinations. As cataract is a slowly developing condition, treatments every two to four months should be continued for at least two years. T. D. ALLEN.

**Wiegman, E.: The Technique of Puncture for Glaucoma** (Zur technik der Glaukومتrepanation). *Klin. Monatsbl. f. Augenh.*, 1920, lxiv, 117.

On account of the danger of the cystic scar following the Elliot method of puncture, the author has worked out a new method. As in the star operation, but without opening the anterior chamber, he introduces a Graefe knife into the upper edge of the cornea from one limbus to the other so that this intracorneal incision is about 4 mm. long. The knife removes the most superficial layers of the cornea, a small flap of the sclera, and a strip of conjunctiva 4 mm. wide and between 4 and 5 mm. long. After the hæmorrhage has ceased perforation of the sclera and iridectomy are done as usual, whereupon the flap is replaced without suture. After three or four weeks only a faint, scarcely visible depression remains. MEISNER. (Z)

**O'Connor, R.: Abducens Palsy; Transplantation of Vertical Recti in Three Cases.** *California State J. M.*, 1920, xviii, 90.

Three cases of complete sixth-nerve palsy operated upon successfully by the author are reported. In 1 case the condition was congenital; in 1, it was acquired but operated upon early; and in 1, it was acquired but operated upon late.

O'Connor divided the superior and inferior recti and sutured their lateral halves, into the insertion of the externus. In the first case reported, binocular vision of the second degree was obtained although the patient was 8 years of age. From this

fact the conclusion is drawn "that the muscle action is guided entirely by the fusion sense, irrespective of what individual muscle or nerve is employed to secure the necessary movement," and that the same principle may be applied whenever any of the other recti are paralyzed.

In the literature 10 cases are reported, 7 of complete and 3 of incomplete paralysis. T. D. ALLEN.

**Mayou, M. S.: A Method of Iridotomy.** *Brit. J. Ophthalm.*, 1920, iv, 124.

Mayou has used the method he describes, which he states is not original, with considerable success. Two parallel incisions are made in the iris and the underlying capsule with a long, narrow, bent, broad-cutting needle. The needle is passed through the tissues as in a running stitch and its handle then deflected. The band of iris and capsule between the parallel incisions is caught with a Tyrrell hook or iris forceps, drawn through the corneal wound, and cut off with an iris scissors.

One advantage of the operation is that if inflammatory tissue should block the pupil, it can be divided with fine iris scissors and its tension will cause it to spring apart. T. D. ALLEN.

#### EAR

**Shambaugh, G. E.: Clinical Problems Relating to Chronic Suppurative Discharge of the Middle Ear.** *Illinois M. J.*, 1920, xxxvii, 203.

The author offers the following conclusions:

1. Chronic suppurative otitis media is a serious disease because of the danger of serious intracranial complications.

2. Many cases of chronic otorrhœa can be cured by conservative local measures.

3. Cases of intractable otorrhœa can usually be cured by radical surgical measures.

4. Radical surgical measures are not indicated in all cases of chronic otorrhœa not cured by local conservative treatment.

5. Cases of chronic suppurative otitis media are of two types: those in which the disease is limited to the mucous membrane lining the middle-ear chambers, and those in which the disease extends to and involves the underlying bone. An intracranial complication is a menace only in the latter type.

6. Cases in which the disease is restricted to the mucous membrane lining the middle-ear chambers call for local conservative treatment only, even though such treatment may not bring about complete cessation of the discharge.

7. Radical surgical measures are indicated only in the relatively few cases in which the process extends to and involves the underlying bone, and not all of these cases justify radical surgical interference.

8. An experienced otologist is now able to differentiate the dangerous chronic otorrhœa from the simple, non-dangerous type. O. M. ROTT.

**Rott, O. M.: A Plea for Early Operative Interference in Acute Suppurative Affections of the Mastoid.** *Northwest Med.*, 1920, xix, 46.

The author reaches the following conclusions:

1. Frequent bacteriological examination of the secretions from an acute suppurative otitis media should be made.

2. Whenever the streptococcus mucosus capsulatus has been identified as the infecting organism, operative interference should be instituted at once.

3. Every case of acute suppurative mastoiditis not responding to approved medical measures after a period of three weeks is potentially dangerous and should be subjected to operative interference.

4. The virulence of the infecting organism, the patient's resistance, and the anatomical configuration of the mastoid process are always variable factors and therefore preclude an absolute forecast of the outcome of any acute suppurative inflammation of the middle ear.

5. A skillful operation on the mastoid in acute disease is practically without danger to life.

6. Operation is the most rational way of dealing with a suppurative focus that does not respond to approved medical measures after a period of three weeks.

7. Operation removes latent foci of infection which sometimes may remain after prolonged and apparently successful non-operative treatment.

8. Operation permits quick resolution of the inflamed tissues surrounding the essential structures which govern hearing.

**Hill, F. T.: The Incomplete Mastoid Operation as a Cause of Delayed Healing.** *Laryngoscope*, 1920, xxx, 154.

Delayed healing following an operation for mastoiditis is due to three factors: (1) the patient's lack of resistance; (2) the virulence of the infection; and (3) the incompleteness of the operation. Of these the first is too often blamed instead of the second; the second is more often a genuine cause of delay in healing; and the third by far the most frequent hindrance to cure.

In exenterating mastoid processes four types are found: (1) pneumatic (37 per cent); (2) diploëtic (20 per cent); (3) pneumodiploëtic (42 per cent); and (4) sclerotic (scattering).

Operation upon the pneumatic mastoid is followed by the shortest and smoothest convalescence and the greatest freedom from secondary operation. Of a series of 168 cases in which a simple mastoid operation was performed and the percentages of the different types of mastoid were those given above, a secondary operation was necessary in 16, and of these only 2 were of the distinctly pneumatic type. In other words, only about 3 per cent of the distinctly pneumatic mastoids required a secondary operation. This is explained by the cellular type of the tissue. Each cell operated upon leads to a neighboring cell not operated upon and thus the entire mastoid area is exenterated. To locate



remote cells, however, such as those above the external auditory meatus, in the root of the zygoma, near the temporomandibular articulation, and in the posterior portion of the occiput, the use of the X-ray may be necessary.

As contrasted with about 3 per cent of secondary operations required in cases of distinctly pneumatic mastoids, about 12 per cent of the diploëtic and pneumodiploëtic mastoids required a second operation. This is explained by the fact that the surgeon, feeling that he had arrived at sound bone, did not remove the complete mastoid although in these cases the diploë may contain just as much potential trouble as the cells of the pneumatic type. Hence the author's contention that unless the mastoid is completely cleaned out to its boundaries a secondary operation may be necessary.

Complete exenteration is made difficult in some cases by the presence of bony partitions in the mastoid cavity which simulate the limiting wall of the cavity. The disease process may be carried into hidden areas deep in these partitions by vascular or osteophlebitic extension. Here the X-ray, and especially stereographic plates, may aid in making the operation complete.

The areas neglected in the cases requiring secondary operations in the series reviewed were the zy-

goma in 4 cases, the posterior meatal area in 2, the tip in 1, the upper angle between the sinus and the floor of the middle fossa in 8, and the area between the sinus and the digastric groove in 9.

After thorough cleaning most of these areas healed rapidly. One case in which there was marked cerebral irritation showed necrotic dura at the angle of the sinus and the floor of the middle fossa. Meningitis and death followed and at the postmortem examination an abscess of the temporosphenoidal lobe was found. Three cases showing perisinus abscess and sinus thrombosis revealed at operation involvement of: (1) the area between the sinus and the floor of the middle fossa; (2) the area between the sinus and the digastric groove; and (3) both of these areas respectively.

A secondary operation was not required in any case in which the mastoid was completely exenterated and care was taken to outline the sinus and the boundaries of the mastoid cavity. It was not considered necessary to uncover the sinus but simply to outline its bony plate. If this were eroded, the course was obvious. In cases so treated the middle ear became dry in from two to five days. The after-treatment seemed of minor importance. The patients were discharged as cured in from four to six weeks.

J. D. Cook.

# SURGERY OF THE NOSE, THROAT, AND MOUTH

## NOSE

Coakley, C. G., and Pearson, W. W.: *External Surgery of the Nasal Accessory Sinuses*. *Surg., Gynec. & Obst.*, 1920, xxx, 309.

In external surgery of the nasal accessory sinuses, especially of the fronto-ethmoid group, it must be determined which cases should be approached by the external rather than by the intranasal route and which operation will give the most satisfactory end-results.

In the authors' opinion the external operation is indicated for orbital cellulitis, spontaneous fistula from rupture of the anterior or inferior wall of the frontal sinus, new growths within the sinuses, cases in which the symptoms persist in spite of attempts to establish satisfactory intranasal drainage, and cases in which the patient refuses to submit to an intranasal operation.

The operation of choice is the Killian operation or some modification of it. The authors' modification of this procedure, which they have used since 1907, is as follows:

Two incisions are made, one for exposure of the vertical portion of the frontal sinus and the other for exposure of the ethmoid labyrinth. The first incision is begun at the median line and extended in a slightly curved direction parallel with and just above the upper margin of the eyebrow to the very outermost position of the external angular process of the frontal sinus. It is carried directly down to the bone. Above it the periosteum is raised as far as the height of the frontal sinus is indicated in the roentgenogram and peeled downward  $\frac{1}{8}$  in. This incision makes it possible to remove the entire anterior wall of the frontal sinus and to bevel the upper margin so that no abrupt or rough edge remains for the periosteum to fall over.

The incision for the ethmoid labyrinth is begun  $\frac{1}{4}$  in. outside of the supra-orbital notch and about  $\frac{3}{4}$  in. behind the juncture of the vertical and horizontal portions of the frontal bone. It is carried in a slightly curved direction downward, midway between the inner canthus and dorsum of the nose, to the inferior border of the nasal bone. From it the periosteum is reflected anteriorly and posteriorly and with the periosteum the pulley of the superior oblique is raised. This incision gives ample space for the exenteration of the ethmoid labyrinth, including the sphenoid cavity, and makes it possible to follow up all the ethmoid cells which extend laterally over the roof of the orbit and at the outer angle frequently communicate with the vertical portion of the frontal sinus.

A particular advantage of the double incision is that the wound can be closed without the puckering

which so frequently results when the single Killian incision is used. The dressing may be removed from the ethmoid incision on the third day. Pressure is maintained by the bandage over the skin of the frontal sinus so that there is little chance for infection by way of the nasal passages.

O. M. ROTT.

Pratt, J. A.: *An Ethmoid Operation*. *Ann. Otol., Rhinol. & Laryngol.*, 1920, xxviii, 1051.

The author suggests that the term "ethmoid labyrinth" should be used only to designate the cells within an ethmoid capsule, the two capsules being separated from each other by two nasal spaces and the septum and each capsule containing an anterior and posterior set of cells. Each capsule is then bounded orbitally by the lachrymal bone and the ethmoid orbital plate; nasally by the middle turbinate; above by the temporo-orbital plate; and posteriorly by three-fifths of the anterior wall of the sphenoid sinus. The nasal accessory sinuses lie in series antero-posteriorly in the following order: frontal sinus, anterior and posterior ethmoidal cells, and sphenoid sinus, each succeeding structure being a trifle lower in the head than the structure just in front of it. The posterior sphenoidal wall is roughly the same distance from the tip of the nose as a point on the temple midway between the temporo-orbital edge and the external auditory orifice.

The frontal and sphenoidal sinuses are so placed that they can be easily treated surgically after ethmoid exenteration, and if the middle turbinate is intact the cribriform plate outside the ethmoid capsule is protected. The author has not found it necessary to remove any of the middle turbinate either to operate upon the ethmoid or to extend his operation into the sphenoid or frontal sinus. He first corrects thickened or deflected septa which interfere with ethmoid exenteration as he considers them the main cause of sinus trouble. Involvement of the anterior ethmoid cells he generally finds associated with frontal sinusitis, and involvement of the entire ethmoid capsule with inflammation in the sphenoid.

The author's operation requires a nasal speculum, a fenestrated punch forceps with a blade measuring 3 by 5 mm., and a double-end, cup-shaped curette bent to 45 degrees at 2 cm. from one end, the cup of which is also fenestrated.

With the patient sitting up and the head well back after cocaineization of the parts the ethmoidal cells are opened just under the anterior end of the middle turbinate. If there is no polypoid or other softening this opening may be made with a chisel or the straight end of the curette. If softening is present



it should be done with the cutting forceps. The tissue is bitten out backward and upward as long as soft bone is encountered, the head being brought forward so that the hard plate of the skull can be followed. Next, all soft cells are removed with the straight end of the curette by a firm but gentle stroke in every direction, the anatomical limits of the ethmoid capsule being borne in mind. Firm, smooth, yielding tissue on the orbital side contraindicates the use of force. The space having been enlarged toward the frontal sinus with the angle end of the curette, the floor of the capsule is cut out back to the sphenoid sinus. The cavity is now cleansed with large swabs used with a whirling movement. Following this, a swab saturated with 3 per cent iodine in glycerin is applied to disinfect and to stop any bleeding. Hemorrhage, however, is slight as the anterior and posterior ethmoidal and the sphenopalatine arteries are not cut. When the iodine swab is removed any overlooked soft parts are removed with it. A finger-shaped cotton swab is then placed, not packed, in the middle meatus and the patient is instructed to remove it in four hours.

Following the operation the patient should sniff a few drops of "nasal oil" into the meatus three times a day while in the supine position with the head well back. Every third day the surgeon should cocaineize, cleanse, and swab the middle meatus with the iodine-glycerin solution.

The operation leaves almost no mark and if the discharge continues may be extended into the sphenoid or frontal sinus.

J. D. COOK.

### THROAT

**Quadri, A.: Papillomata of the Larynx in Children** (Papilomas de la larynge en los niños). *Semana méd.*, 1920, xxvii, 254.

The most common site of papillomata in the larynx is the free border of the vocal cords, but they may occur also on the false cords, the epiglottis, and the arytenoid and subglottic regions. Usually they are found in one of three forms: (1) as small granulations varying in size from that of a grain of rice to that of a lima bean, (2) as tumors the size of a coxcomb, or (3) as a tumor occupying the entire larynx. They are most common in children between the ages of 2 and 8 years.

The chief symptoms are a change in the voice, respiratory noises, and dyspnoea. The voice changes vary from simple hoarseness to complete aphonia according to the location and size of the papilloma. A cough is often present and begins when the papillomatous mass acts as a foreign body in the glottis. In such cases respiration is noisy. The dyspnoea varies according to the volume of the tumor and is induced by a change in position, violent movements, and crying. Symptoms of suffocation are frequent and the suffocation sometimes results in sudden death.

If the presence of a papilloma in the larynx is suspected the child should be taken to a laryngologist.

In the cases of some children a laryngeal examination can be made easily, while in the cases of others chloroform must be given. Killian's method of laryngoscopy was employed by the author at first, but he now prefers a modification of it which he calls the "Perez spatula" method. When the diagnosis must be made without the aid of laryngoscopy the condition must be differentiated from tracheobronchial adenopathy, hypertrophied thymus, foreign body in the larynx, congenital laryngeal stridor, and chronic subglottic laryngitis.

The treatment is both medical and surgical. The efficiency of medical treatment alone, however, is very doubtful and usually such treatment should be combined with surgery. Arsenic is the drug most commonly employed and is given in the form of Fowler's solution, sodium arsenate, or cacodylate. Magnesia is also given. In some cases the introduction of radium into the larynx after tracheotomy has been beneficial.

Respiration can be restored to normal quickly only by means of surgery. In urgent cases tracheotomy is performed. The tumor is usually extirpated by the intralaryngeal route, laryngofissure, or laryngotomy. Tracheotomy alone does not effect a cure. Intralaryngeal extirpation by means of the laryngoscope is extremely difficult and therefore usually unsatisfactory in children. Even where there is danger of asphyxia tracheotomy is avoided if possible, the tumor being extirpated rapidly with the Perez spatula. If tracheotomy is necessary, the tumor mass is extirpated at the same time and the cannula withdrawn as soon as possible. In cases of recurrent tumor the growth is extirpated as often as necessary and the base cauterized with lactic or salicylic acid. In cases of tracheal stenosis from vegetations on the laryngeal mucosa, thyrotomy and laryngotomy are done. The use of radium following tracheotomy is recommended.

W. R. MEEKER.

**Davies, B. C.: Thyrotomy in the Removal of a Subglottic Laryngeal Epithelioma.** *J. Am. M. Ass.*, 1920, lxxiv, 888.

A median incision was made from the os hyoideum above to the level of the fourth ring. Careful dissection was then done, exposing the thyroid and cricoid cartilages and tracheal rings. Whenever possible, blood vessels were ligated before the cutting was done. This was not always feasible, but the amount of blood lost did not exceed 2 oz. When the field of operation was entirely exposed, the second tracheal ring was incised and a No. 4 tracheotomy tube inserted. At this stage the anesthetist changed his position and administered the ether by means of a saturated pledget held over the opening of the tube. An attempt was then made to incise the thyroid cartilage by passing a knife through the cricothyroid ligament, but in this particular case ossification had taken place and bone had replaced the cartilage. Several efforts were made with different instruments, the necessity of avoiding injury to the cords being kept in mind. Finally separation of



the lateral halves was effected with a heavy pair of Seiler's turbinal scissors.

Even retraction of the lateral halves gave a good view of the neoplasm which was without a pedicle and situated under the left cord. The growth was incorporated in the body of the cord for its full length, the edges being free. A gauze pack was introduced into the trachea at the cricoid level to prevent leakage of blood from above, as well as to aid the anæsthetist by forcing respiration through the tracheotomy tube. A wide and careful dissection was done. The incision was carried down to the lateral wall of the thyroid and back to the arytenoids. It included the cord with the tumor mass but left a narrow border of the upper portion of the cord. The tissue below the site of the tumor was dissected and the edge then drawn up and sutured to this remaining portion of the cord. In this way a line of articulation for the right cord was afforded. Subsequent events have justified the procedure as the patient's phonation is quite as good as before the operation. The hæmorrhage was very slight, and only three catgut sutures, No. 00, were necessary to close the tumor site.

The tracheotomy pack having been removed, the halves of the thyroid cartilage were brought together and held by chromicized catgut through the perichondrium and surrounding tissue. The skin was closed with silk worm sutures. Over a dry dressing a stiff collar of several layers of adhesive plaster was applied to immobilize the thyroid cartilage. This collar was re-applied after each dressing until union of the halves was secured. The tracheotomy tube was removed on the fourth day and the wound closed in three weeks.

O. M. ROIT.

**Todd, H. C.: Surgery of the Tonsil.** *J. Oklahoma State M. Ass.*, 1920, xiii, 100.

In the author's opinion adhesions and contractures following certain tonsil operations are due to: (1) trauma or destruction of the tonsillar plicæ or the tearing of their attachments, or (2) trauma or destruction of the muscles or their aponeuroses which form the tonsillar fossæ.

The plicæ, anterior and posterior, are the superficial layers of the mucous membrane in which the tonsil is developed. The structures deepest in the tonsillar fossæ are the musculature of the tonsillar pillars. The superficial structures are, first, the aponeuroses of these muscles; next, the basement membrane of the mucous membrane enveloping the tonsil; next, the tonsil itself; and then the anterior and posterior plicæ, the layers of the mucosa other than the basement membrane which lie upon the tonsil and partly envelope it. The anterior plica or plica triangularis alone is constant, but both, when present, are continuous at the tonsillar margins with the mucosa of the tonsillar pillars and therefore with the pharyngeal walls.

The author contends that these plicæ must be carefully dissected up rather than torn from the subjacent tonsil. Next, the capsule should be separated

from the muscular aponeuroses without injury to the latter or the now loosened plicæ. For this step especially Todd recommends tonsillar scissors or Pierce's sharp spoon dissector. In the next step in the operation the base is detached with the aid of a snare.

When the plicæ are preserved they partially line the emptied fossa without contractures and give off epithelial buds which further hasten a smooth healing.

J. D. COOK.

**Simpson, J. R., and Noah, H. G.: Report of Two Cases of Lung Abscess Following Tonsillectomy under Local Anæsthesia in Tubercular Subjects.** *Pennsylvania M. J.*, 1920, xxiii, 322.

Contrary to the commonly accepted view relative to the causation of lung abscess following tonsillectomy, the authors believe the two cases here reported were due to hæmatogenous infection because of the following facts:

1. Both patients were operated on under local anæsthesia in the upright position.
2. The mouths and throats were in a septic condition before and for some time after the operation.
3. The late development of symptoms (eleven and twelve days after operation) points to a blood-stream infection.
4. The abscess developed at the site of the tuberculous lesion which in both cases was in the upper and middle lobes.

The conclusions drawn are:

1. During or following operation septic material enters the veins, passes through the right heart to the lungs and, in the presence of a tuberculous lesion, finds there suitable soil for the formation of an abscess.
2. The possibility that the aspiration of infected material may be a cause of pulmonary abscess is not to be denied, yet a greater number of such abscesses occur as a result of hæmatogenous infection than is generally supposed.

O. M. ROIT.

## MOUTH

**Steadman, F. S.: Dental Sepsis in Children: Its Consequences and Treatment.** *Proc. Roy. Soc. Med.*, Lond., 1920, xiii Sect. Odontol., 37.

The author formerly shared the popular opinion that the condition of pale-faced, tired-looking under-weight, and mentally inefficient children was usually the result of semi-starvation due to poverty. He has discovered, however, that in a large percentage of cases carious deciduous teeth and first permanent molars, exposed and putrescent pulps, and abscesses about the teeth are etiological factors and that extraction of the teeth is followed by restoration to health.

One of the chief causes of the deterioration in health is loss of sleep due to the pain associated with the dental condition. Other causes are gastrointestinal disorders. The rapid clearing up of the latter after the extraction of the teeth is similar to



the improvement noted by Waller in sickly breast-fed babies after the extraction of septic teeth in the mother. Oral sepsis may aggravate existing anæmia, tuberculosis, typhoid, and scarlet fever and may result also in septicæmia and endocarditis. Locally it may spread to adjacent tissues causing pharyngitis, tonsillitis, otitis media, etc. Finally it may be the cause of enlargement of the lymphatics draining the area involved. This clears up if extraction is done early.

The author's treatment consists in the extraction of all deciduous teeth with infected pulps and generally of their antagonists in addition. Permanent molar teeth with roots not fully formed are also extracted. Pulp capping is condemned. The argument that extensive extraction is not advisable as it causes a loss of the power of mastication is futile as this power is already lost before the extraction. No child will masticate on tender teeth and exposed pulps. The argument that extraction prevents the proper growth and development of the jaws is also untenable in the majority of cases. Unilateral mastication should be prevented as it causes a marked gingivitis on the unused side. All condemned teeth should be extracted at one time under a general anæsthetic such as ethyl chloride. LOUIS SCHULTZ.

**Burns, R.: Why "Pulling" Teeth Fails; A Plea for Their Surgical Removal When Evulsion of These Organs Is Indicated by Infection.**  
*Dental Cosmos*, 1920, lxii, 371.

The author advocates the surgical removal of teeth whenever evulsion is indicated. The technique of this procedure includes the formation of a triangular flap over the labial or buccal root or roots, the removal of the outer plate of bone, and the lifting of the tooth out of its socket. This is followed by the complete eradication of the entire infected area and, when a number of teeth are removed, by the removal of the alveolar septa and the trimming and smoothing of the bone. The wound is closed by suturing the flap into place.

Teeth which should be removed are devitalized teeth, abscessed teeth, teeth badly infected with pyorrhœa, and pulpless teeth. The removal of pulpless teeth is indicated on account of the uncertainty of root canal treatment, the probability that the dentin in such teeth will become infected, and the pathologic changes which are found so frequently in the peridental membrane surrounding them. Mere extraction of such teeth is insufficient as the coexisting pathology cannot be successfully eradicated in this manner. LOUIS SCHULTZ.

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# INTERNATIONAL ABSTRACT OF SURGERY

AUGUST, 1920

## COLLECTIVE REVIEW

### BRACHIAL SYMPTOMS CAUSED BY CERVICAL AND THORACIC RIBS

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CERVICAL ribs are known to produce hand and arm disturbances. The cause or contributing agent has been found in anomalous and even in normal first thoracic ribs. Other factors beside the ribs—such as anomalous or over-developed fascia, muscle bands, and other abnormalities—may contribute to these disturbances. Many treatises on anatomy, however, do not describe the normal relations of the soft and bony structures completely or mention the frequency of variations. Anomalies or variations of the soft parts as well as of the skeleton are frequent and it is unusual to find a body which is without some variation from the text-book descriptions. Occasionally even a text-book illustration shows a rare anomaly and thereby leads to the inference that the condition is normal.

#### VERTEBRAL CHANGES

Vertebral changes are almost constantly associated with variations in the ribs.

In comparing the statistics of numerous investigators Bardeen summarized those given for 1,059 spinal columns. Forty-six of these spinal columns were those of embryos, 55 those of fetuses, 50 those of children, and 908 those of adults. Twenty-four presacral vertebrae, which is the normal, were found in 91.3 per cent. The vertebra fulcralis is most closely associated with the sacrum and is usually the twenty-fifth. The number of spines with 23 and 25 presacral vertebrae was about equal, i.e., 4.3 and 4.4 per cent of the total number respectively. In rare cases there may be 26 presacral vertebrae. The explanation of this variation according to Rosen-

berg's hypothesis is that in man the sacrum is composed at first of a more distal set of vertebrae than those found in the adult. During development the lumbar vertebrae are converted into sacral vertebrae and the sacral vertebrae into coccygeal vertebrae, or during ontogenesis the iliac attachment of the limb advances along the spinal column. This change of position is believed to correspond to a similar change taking place in the phylogenesis of man. Rosenberg assumes that variation in the adult is due largely to failure of this process to extend upward as far as usual during ontogeny or to its extension beyond the usual limits.

Paterson states that the shifting is more frequently caudalward and that the lumbosacral plexus has a tendency to assimilate post-axial rather than pre-axial roots. The sacral mass would then assimilate the first coccygeal vertebra rather than the fifth lumbar. The movements of the nerve trunks and variations of the sacral mass were found by Paterson to be in harmony. This is contradictory to Rosenberg's theory of phylogenetic shortening of the vertebral column.

Dwight suggests that irregular segmentation leading to intercalation and excalation explains the numerical variation—the presence of an additional or the absence of a normal vertebra. This assumption implies a correspondence of vertebrae between which changes occur and explains unilateral duplication and other variations.

The tendency of variation in the two halves of the spine is to some extent independent. Dwight believes that the greater or less develop-

ment of the costal elements is the cause of the vast majority of vertebral variations. In his opinion there is more than merely an increase in size of a costal element of the vertebra in cervical ribs, since a cartilage is found frequently shooting out from the manubrium to meet it. He concludes that the variations occur in two ways: (1) by the irregular development of the costal elements at or near the ends of the regions of the spine; and (2) by irregular segmentation as a result of which there are more or fewer vertebræ than normal.

Leboucq considers the area between the second and third cervical vertebræ a critical point and believes the third vertebra is exposed to more modification than the others. Such modification may result in increased segmentation or assimilation of the third vertebra. When the third vertebra is assimilated only 6 cervical vertebræ remain, and in some animals, the lamenin, this number is normal. In Leboucq's two cases of 8 cervical vertebræ the extra vertebra was the third.

Anomalies of the number of vertebræ are frequently associated with cervical ribs or rudimentary thoracic ribs.

In a case reported by Low there were 25 presacral vertebræ, a rudimentary first rib, and 13 pairs of ribs. Low believes the extra vertebra was the first sacral and that, as is true in most cases of 13 ribs, the shifting of the pelvis forward was arrested. Dwight reports a case and quotes one reported by Gruber in which, with cervical ribs, there was absence of one dorsal vertebra. Bellamy reported a unique case in which there were 6 lumbar vertebræ and a rudimentary first rib. In Lane's opinion the supernumerary vertebra bearing rudimentary ribs was the eighth cervical and not a thoracic vertebra. In a case reported by Meyer in which there were 8 cervical vertebræ a cervical rib was found on one side only.

#### RIBS

Each rib is represented at the beginning of the second month of foetal life by a pyramidal mass of condensed mesenchyme which projects from the posterior one-third of its segment ventro-laterally for a short distance into the body wall. The rib becomes cartilaginous in the sixth week and by that time is S-shaped. The change to a definite curve is effected by a lateral addition and a medial subtraction of cartilage. The cell and interstitial growth take place medially.

Periosteum appears at the seventh week. In the eighth week osteoblasts are numerous and cal-

cification and bone form like a gutter on the lateral one-third of the rib (Geddes). Leboucq was the first to postulate the existence of two morphological units in the development of a rib, an anterior and a posterior unit, the anterior arising from the sternum. Embryologically each cervical vertebra has a costal process which, with the transverse process, forms the costo-transverse foramen. This costal process may develop abnormally into a cervical rib (Henderson). Leboucq stated that in most cervical vertebræ the ventral limb of the transverse process is ossified by ingrowth at one end from the radix and on the other by ingrowth from the tip of the transverse process. In the seventh cervical vertebra (frequently in the sixth, occasionally in the fifth, and rarely in the fourth) a separate center of ossification for the costal element may develop between the second and the fifth months. While this costal element may remain free as a cervical rib, it usually becomes fused with the osseous projections from the radix and the transverse process (Keibel and Moll).

Wiedersheim states that the thirteenth rib, which always appears in the embryo, begins to degenerate as soon as the twenty-fifth vertebra is incorporated into the sacrum. Gladstone reports a case in which there were 13 thoracic vertebræ with ribs and considers this a persistence of the foetal thirteenth rib. Many primates, among which are the orang, gibbon, chimpanzee, and gorilla, have 13 or 14 ribs normally.

Tredgold states that there is not only a reduction in the total number of ribs as we rise in the animal scale, but a coincident and proportional reduction in the number of sternal ribs. The eighth becomes a costal and not a sternal rib and there is a shortening of the thoracic cavity from below.

According to Rosenberg, a progressive change is shown in man by the absorption usually of cervical ribs with the lower thoracic ribs, and a retrogressive change is shown by the presence of additional ribs. A variation of the opposite nature also occurs frequently.

#### CERVICAL RIBS

Most cervical ribs are short and incomplete. The nearer they approach complete disappearance the more they approach the normal. In this they are in contrast to the rudimentary first thoracic ribs which usually extend to the nerve plexus and are rarely short and process-like. In the first rib the variation from normal becomes greater as the rib approaches obliteration while the cervical rib varies from the normal more



decidedly as it approaches complete formation and union with the sternum. The slighter variations from the normal are the more common. Gruber classifies cervical ribs as follows:

1. A short process-like projection which does not extend beyond the lateral dimensions of the transverse processes of the vertebra.
2. A blunt process of bone extending 4 or 5 cm. beyond the lateral process.
3. A rib which extends sufficiently far forward to articulate with the first rib, to the external border of the scalenus anticus, or so that it is attached to the sternum by a ligamentous cord.
4. A complete rib with a costosternal cartilage, the cartilage being separate or combined with that of the first rib.

As to the frequency of cervical ribs, Fischel found them in from 0.9 to 1 per cent of bodies examined. Todd states that a rib articulating with the seventh vertebra or a rudimentary first rib occurs in about 1 per cent of cases. In my own observations on about 100 cadavers I found them more frequently. According to Streissler, they are bilateral in 67 per cent and unilateral in 33 per cent. Streissler found 60 per cent of the unilateral ribs upon the left side and Walther found such ribs on the left side in 63.5 per cent of cases.

Boehm states that the variations are greatest in the male in the caudal end of the spinal column, and in the female, in the cranial end, and that they occur on the left side. This is in agreement with the more frequent occurrence of cervical ribs in women upon the left side.

Cervical ribs are found occasionally in several members of one family (Streissler).

The etiology of costal anomalies in the cervical region is undoubtedly multiple. Blood vessels or nerves may influence the development of the rib or it may be the result of errors in segmentation or a variation in the development of the bony tissue. Todd states that the blood vessels tend more than the nerves to cause fusion of the highest rib with the second and the substitution of a ligamentous band attached to the sternum for a part of the rib anteriorly. He believes that the nerves are more common factors in the entire separation of the rib from the sternum.

According to Wood Jones the cervical vertebrae in man do not normally carry ribs because the development of such ribs is prevented by the plexiform arrangement of the nerves running to the arm which develops earlier embryologically. In his opinion nerve pressure is a cause of rudimentary cervical ribs and first thoracic ribs. The nerves denote the development first of the

vertebrae and later of the ribs. The postfixed plexus or inclusion of the second thoracic nerve may also be a factor in the development of rudimentary cervical or first thoracic ribs.

Eisler has stated that when a well-developed seventh cervical rib is found, the brachial plexus receives only a small branch or none at all from the first thoracic nerve. Black found asymmetry of the nerve trunks with asymmetry of cervical ribs.

#### ANOMALIES ASSOCIATED WITH CERVICAL RIBS

Putti states that a costal anomaly is inseparably associated with a vertebral anomaly (Hodgson). Other changes in the thorax may be dependent upon the size of the cervical rib as the rib and vertebra may take the place of a first thoracic rib. The processes of all of the upper vertebrae may be modified and they may all take the place of a different vertebra. Chassaignac's tubercle may be on the fifth vertebra and there may be other changes to correspond. The most frequent deformity is scoliosis. In Schoenbeck's collected cases (1905) scoliosis was found in 22, the convexity being toward the cervical rib if the condition was unilateral, and toward the larger rib if it was bilateral. Streissler found scoliosis in 16 per cent of his cases. Murphy stated that cervical ribs are present in 2 per cent of all cases of scoliosis.

Other defects may be cleft formation of the vertebrae; supernumerary, incomplete and misshapen vertebrae; or absence of vertebrae. Synostosis of one or more cervical vertebrae is common. Bifid ribs, kyphosis, and lordosis are other variations. Variations of the sternum may be associated with cervical ribs and especially with the development of a cartilage tip from the manubrium to meet a cervical rib. Other defects are club-foot, undescended testicles, and disturbances of the central nervous system such as hysteria, neurasthenia, syringomyelia, and multiple sclerosis (Streissler). According to Keen, most of the associated defects are defects in the development of the central nervous system, syringomyelia, multiple sclerosis, and progressive muscular atrophy of the cervicobulbar type. In his own cases of cervical ribs he found no defects of the soft parts or the skeleton.

#### RUDIMENTARY FIRST THORACIC RIBS

Rudimentary first thoracic ribs are undoubtedly much less frequent than cervical ribs, but in some cases it is practically impossible to determine upon the skeleton whether a rudimentary rib is a cervical or a first thoracic rib (Dwight). However, since rudimentary first thoracic ribs have been found to produce symptoms similar to those due

to cervical ribs, it is not so necessary to classify the rib as to recognize the symptoms and rule out other possible causes. Symptoms produced by rudimentary first thoracic ribs have been reported by Outland, Russell, Hoosle, Clerc, Didier, and Bobrie.

The difficulty in diagnosing the rudimentary rib may be increased by the intercalation or excalation of a vertebra. Unless the roentgenogram includes all the vertebrae a rudimentary first rib is usually believed to be a cervical rib.

A normal first thoracic rib is flat in only one plane. An abnormal first rib may be bent at its axis. According to Jones, this twist is common in cervical ribs. The first rib may be turned down and bent at the point crossed by the brachial plexus. Ventrally from this point it is sometimes reduced wholly or partially to a membranous strand or is entirely absent. In a further stage the first rib is represented only by its proximal part which articulates with the second rib or is fused with it, giving rise to a so-called "bicipital rib." As a rule when the rib is incomplete it is deficient in the distal portion, but because of its development from two portions this deficiency may occur anywhere or for any distance along the rib.

Rudimentary first thoracic ribs nearly always extend to the region of the brachial plexus. Such ribs approach the normal more nearly than the shorter stump-like processes. Wood Jones suggests that the reduction is due to pressure by the nerve and that in such cases there is a distal displacement of the brachial plexus in respect to the constituent nerve cords.

Anomalies associated with rudimentary first thoracic ribs are frequent. Low describes a case in which there were 13 pairs of ribs with 25 presacral vertebrae. Leboucq found the division of the manubrium and sternum below the second rib in 2 cases. In the gibbon the separation of the manubrium at the third rib is normal but has been found only once in man. Hertslet and Keith state that rudimentary first ribs are characteristic of the Magyars.

In a horse, Bradley found a fibrous band extending to the sternum. Struthers discovered a similar band in a three-toed sloth and Adolphi another in a dog.

A "bicipital rib" is the fusion of 2 ribs and not the bifurcation of a rib into 2 heads. This fusion may be between a cervical and a first thoracic rib or between the first and second thoracic. Other ribs may also be bicipital, especially the third and fourth thoracic. Certain whales are classified into a different genus because they possess a bifid rib. In Turner's opinion this

"bicipital rib" is formed by the fusion of a cervical rib and the first thoracic with occasional variations and does not constitute an adequate basis for a separate classification.

#### PATHOGENESIS

In order to give rise to symptoms a cervical rib must be of fairly large size so that it will produce pressure on the nerve plexus or the subclavian artery. Borchardt states that only 5 or 10 per cent of cervical ribs are associated with, or the cause of, symptoms.

There is no fully satisfactory explanation why symptoms occur in only a part of the cases. When they do occur they usually begin in young adult life and are more common in women. Thorburn and Morley have recently stated that symptoms may be caused also by rudimentary first thoracic and even normal first thoracic ribs. Stopford and Telford report several cases in which the symptoms were relieved by the resection of an apparently normal first rib and Murphy reports a case in which complete recovery followed the removal of a normal first rib.

The bony prominence against the nerves or blood vessels is in a position to cause symptoms merely by mechanical pressure upon the nerves. In the absence of a bony rib a fibrous band extending from the rudimentary rib may act in the same manner. The upper edge of the rib may be sharply beveled and the nerve roots may be stretched over it. The greater frequency of symptoms on the right side is explained by the greater use of the right arm. Branches from the first and second thoracic nerves may not be sufficiently large to stunt the rib, but with some exciting factor, such as trauma, may produce symptoms later (Wood Jones). This, however, does not explain the onset in adult life and the greater frequency in women. After the development of the ribs, ossification, a decrease in elasticity, and an increase in rigidity take place and may be factors in the causation of symptoms. Thorburn and others believe that the complete ossification of cervical ribs which occurs in early adult life is responsible for the onset of the symptoms. Direct trauma due to carrying objects, such as a rifle, on the shoulder, forceful motions of the arms, or even slight trauma where tension is already present (such as may result from the motion of the thorax with respiration) may be the exciting factor. In other cases trauma may be caused by carrying the shoulders forcibly up and backward, which brings the clavicle nearer the rib and compresses the nerves and blood vessels (Thorburn).



Todd (1911) studied the relation of the soft parts to the normal first rib before and after abduction of the limb. In formalin-hardened specimens it was found that abduction made no real alteration in the relation of the several structures at the inner margin of the first rib. However, in Todd's opinion the alteration in position of the soft parts explains the relief of pain experienced in cases of cervical rib when the arm is raised from the side. In this connection Todd describes an injury to the cervical nerves in a giraffe due to forced abduction of a paralyzed front leg. In a series of dissections Todd found that the nerve lay in contact with the rib in normal cases more frequently upon the right side while the artery was in contact with it only in exceptional cases. On the left side the reverse was true.

In a large series of dissections Wood Jones has demonstrated that the sulcus subclaviæ is usually formed by, and lodges, the lowest cord of the brachial plexus and is not a groove for the subclavian artery from which it receives its name.

The consideration of a post-fixed or low plexus deserves attention. Anatomical studies have demonstrated the existence of both post-fixed and prefixed or low and high plexus.

Sherrington states that the nerve supply of the scalenes, diaphragm, skin, and cervical sympathetic all show the brachial plexus to be somewhat prefixed in man as compared with the macaque.

On the basis of his dissections on apes and other animals, Todd at first concluded that the brachial plexus in primates tends to be prefixed. In man the shoulder has dropped farthest backward onto the chest and the brachial plexus is set more anteriorly as compared with other animals. This cephalic migration he considered to be an adaptation to posture, its purpose being to prevent pressure on the lowest brachial trunk. More recently, however, he has found this view untenable as the erect attitude itself involves changes in the position of the first rib of sufficient magnitude to prevent such injury. Further dissection showed that the hind-end of the brachial plexus was remarkably constant and he therefore concluded that it is incorrect to state that the mammalian plexus is prefixed in man as compared with other animals (except the *ceropithecidae*).

In the report of his study of the contribution of the second dorsal nerve to the brachial plexus Todd brings out several interesting points. Cunningham found a communication from the second dorsal to the first dorsal in 70 per cent of the specimens examined. Todd states that the first

dorsal nerve divides into two branches. The first branch goes to the brachial plexus and the second supplies the first intercostal space. The second dorsal nerve gives off a communicating branch which is variable in size though usually small and joins either one or both branches of the first dorsal. The function of this communicating branch to the lower branch of the first dorsal is to assist in supplying the first interspace. The function of the other branch which leads to the brachial plexus is still uncertain but undoubtedly variable. Harris states that the second dorsal nerve contributes motor fibers to the intrinsic muscles of the hand. Sherrington found this constant in the macaque. Others believe it contributes only sensory fibers to the arm.

After careful study Todd concluded that among mammals there is great variation in the communicating branches given by the second dorsal nerve to the brachial plexus. He found the communication between the first and second dorsal nerves composite in nature, partly spinal and partly sympathetic. In some instances the sympathetic fibers predominated. Histologically this communicating branch was found to be composed of both medullated and non-medullated fibers. It should be borne in mind that many sympathetic fibers reach the plexus through the first dorsal nerve. Todd believes that the vascular symptoms as well as the nervous symptoms of cervical rib are the result of pressure phenomena.

Physiological severance of vascular nerves from their proximal connection was held by Bethe to have no influence in causing degeneration of the nerves or vessels.

Todd believes that the variability in the number of sympathetic fibers passing in the communicating branch from the second to the first dorsal nerve will affect the symptoms of the lesion for if a large proportion of the sympathetic fibers reach the plexus in this manner they will be in a position which will render them more liable to injury, i.e., on the under aspect of the combined cervical eighth and first dorsal nerves. On the other hand, if the majority of sympathetic fibers join the brachial plexus by way of the first dorsal nerve, it is possible that, lying on the upper aspect of the nerve, they may escape injury for a time.

In a clinical study Todd (1911) showed that there was a marked obliquity of the upper thorax in the different phases of respiration. This obliquity, which increases the likelihood of interference with the nerve trunks, is more definite in women than in men because of the greater movement of the upper chest in women. Other

factors affecting vascular relations are the action of the scalenes, especially the anticus, the descent of the diaphragm, and the descent of the heart in inspiration.

Streissler states that if the artery is pressed upon by the rib the radial pulse will diminish during inspiration and the blood pressure will be lessened.

Todd (1912) concluded that it is necessary to consider descent of the clavicle after birth in order to explain the mechanical pressure caused by the first rib on the lowest brachial trunk. He believes two factors are at work, one acting at each end of the bone without reference to the other. The factor producing descent of the inner end of the clavicle is the tilting downward of the anterior end of the first rib. This is due largely to tonic contraction of the recti abdominis muscles. The descent of the inner end of the clavicle is greater in men than in women because of the greater tonicity of their muscles. The descent of the shoulder and outer end of the clavicle is modified by the development of the surrounding muscles and is greater in women than in men. In consequence, pressure is most apt to develop on the lowest cord of the plexus in women at the beginning of adult age when the greatest descent has occurred. It was noted also that respiratory excursion is greater in women and in the body when in a recumbent position.

The scalenus bundle may play a part in the pressure phenomenon. The fact that the vein is rarely involved may be due partly to lack of fixation as it lies in front of the anticus. Murphy believed that both nerve and vascular symptoms are due to compression by the growing cervical rib and the scalenus anticus. The scalenus anticus normally fixes the artery anteriorly. The lowest trunk of the brachial plexus, however, is also fixed in proportion to the development of the costopleural ligament and the scalenus minimus muscle. The scalenus minimus passes between the nerve bundles and the artery. In a series of dissections the writer has found the band and ligament quite constantly and in some cases markedly developed and closely surrounding the nerve cords.

In some cases nerve disturbances may be due entirely to circulatory changes. Changes due to retraction of the dome by healed tuberculosis, pleuritis, pressure by exudate, tumor, or other conditions may affect the nerves or blood vessels. Narrowing of the space around the cervical rib, as in cases of periostitis, exostosis, or other pathologic processes, or around the clavicle in cases of fracture of the clavicle, may occur as in a case described by Streissler in which the callus pressed

the nerves against the cervical rib. Any one of the causes of toxic neuritis, such as diphtheria, arthritis, and arteriosclerosis, may produce symptoms. Symptoms may be due also to local involvement of the subclavian. A patient seen by von Bergmann developed symptoms after paralysis following diphtheria and on examination a cervical rib was found. Todd in 1912 reported a case in which brachial plexus symptoms developed after paralysis of the trapezius.

#### SYMPTOMS

There are two groups of symptoms characteristic of cervical rib, namely, nerve and blood-vessel symptoms. The nerve symptoms may be neuralgic, paralytic, vasomotor, or trophic in character. The vascular disturbances may be arterial with temporary obstruction at the rib, peripheral vasomotor changes, or endarteritis with or without occlusion by thrombosis. Venous disturbances with oedema are rare. In a review of 360 reported cases of cervical ribs with symptoms Halsted found that there were nerve symptoms alone in 65.3 per cent, both nerve and vascular symptoms in 29.4 per cent, and vascular symptoms alone in 5.3 per cent. The nerve symptoms vary from a tingling to neuralgia and from ataxia to paralysis.

The lowest cord of the brachial plexus is the one most commonly affected and gives rise to symptoms through the ulnar nerve and the nerve of Wrisberg. According to some observers the first dorsal root sends motor fibers to the intrinsic muscles of the hand only, while according to others it contains also the nerves of the long flexors of the fingers. As has been stated, the second dorsal frequently contributes a branch to this root.

Dupré and Todd describe a case of cervical rib in which the trunk of the seventh nerve was unprotected from damage by the anterior ends of these ribs. Clinical cases have been reported in which the symptoms appeared on the radial border of the hand, indicating involvement of the seventh root or perhaps a communication between the median and ulnar nerves. Church states that sensory disturbances of the radial nerve are present in a fair proportion of cases.

Renton describes a case in which there were girdle pains around the ribs on the same side as a long cervical rib, and disturbed sensation along the lesser internal cutaneous, the internal cutaneous, and the ulnar nerve. He explains that the girdle pain may be a reflex from the lesser internal cutaneous to the second intercostal nerve by way of the intercostohumeral which communicates with both.



Trophic or vasomotor disturbances of the hands develop frequently. That these may be due to either a primary nerve injury or an arterial injury, that secondary changes in the nerves may result from an arterial injury, and that endarteritis with occlusion of the artery may result from a nerve lesion has been well proven by studies of war injuries. However, the development of trophic changes when there is only an arterial lesion may be due to the associated injury to the perivascular sympathetic nerve.

Leriche and Heitz call attention to the fact that previous workers (Babinsky, Froment, and Heitz) have shown that a vasomotor contraction is a constant accompaniment of paralyses and reflex contractures. They have noted also that so-called ischæmic paralysis may follow obliteration of the artery and suggest that the symptoms are due, not to the arterial wound, but to the concomitant injury to the sympathetic nerves. Consequently in cases in which there are reflex troubles, such as contractures, coldness, cyanosis, oedema, and circulatory disturbances in paralysis, they dissect away this perivascular sheath or resect the sheath and vessel.

The operation is performed by thoroughly dissecting the cellular sheath of the artery which carries the sympathetic vasomotor fibers or, if the artery is occluded, by resecting the segment. The denudation must reach a length of at least 10 or 12 cm.

The results demonstrate that:

1. After a short period of arterial constriction, during the manipulation of the vessels, the operation is followed by an elevation in the blood pressure of the limb operated upon.

2. After a period of arterial constriction, it is always followed by an intense vasodilatation lasting several weeks and an increase in the temperature.

3. Resection of the obliterated artery is followed by a more intense and lasting dilatation than denudation.

4. Both operations improve the voluntary contraction of the muscles, the motor power of which was previously abolished.

Circulatory disturbances in paralysis and reflex contractures are associated with local vasoconstriction. These may temporarily disappear following the application of artificial heat. The effect of the vasodilatation obtained by the sympathectomy should be increased by hot baths of paraffin and proper exercise. The favorable action of the operation is due not only to the increased temperature and vasodilatation but also to the improvement in the metabolism

resulting from better oxygenation and better removal of waste products.

Stopford concludes that the so-called trophic disturbances are the result of vascular changes produced by incomplete nerve division associated with nerve irritation. That they are the result of uncomplicated nerve injury is evident from the improvement which follows neurolysis or resection and suture. Stopford gives proof that nerve lesions due to irritation may produce changes in the walls of arteries supplied by the nerve. A case in which there was a peripheral endarteritis in the walls of the arteries supplied by a nerve with a lesion due to irritation but no blood-vessel injury is reported in full. Stopford agrees with Todd that trophic lesions are preceded by vascular changes. Anatomical research by Kramer, Potts, and Todd has shown that the vessels of the limbs are supplied directly from the various nerve trunks and that the vascular nerves do not pass distally as a peri-arterial plexus to their distribution on the peripheral vessels. This work has proved also that the nerves supplying a muscular or skin area supply also the blood vessels of that area.

In a number of cases in which vasomotor, trophic, and secretory disturbances were present and were considered to be due to division or damage to the nerves of the limb Meige and Athanassio-Bénisty found that these changes appeared only when there was an associated arterial lesion. They believe that a co-existing arterial lesion is present in every case in which these disturbances are noted and that they are due, not to nerve lesions, but to the arterial lesion.

Exploratory operations for the mobilization of nerve trunks were usually followed by improvement in the trophic disturbances.

A common conclusion drawn by Stopford and Meige and Athanassio-Bénisty was that efforts should be made to give early relief from irritation in order that secondary vascular changes in the distal part of the circulation may be prevented.

Burrows believes that extensive paralytic phenomena may follow a vascular lesion independently of any direct traumatism of the main peripheral nerves. He calls this "angiotic paralysis." It appears that an incomplete injury or severance of the artery is more apt to be followed by extensive sensory loss and flaccid paralysis than complete division or ligation. Therefore Burrows concludes that the former symptoms are reflex in character and divides angiotic paralysis into reflex and ischæmic paralysis. In the reflex paralysis there is only a partial obstruction of the circulation, the symptoms

being reflex. This paralysis is characterized by absence of the "pins and needles" sensation, by flaccid paralysis of the muscles, which are soft, and by widespread cutaneous anæsthesia extending sometimes well above the level of the injury and not corresponding to any definite nerve distribution.

The ischæmic type of paralysis is that in which the obstruction is complete and the nervous disturbance is a direct result of ischæmia. In such cases anæsthesia is of a "stocking" or "glove" distribution confined to the portion of the limb which is distal to the injury and involves all forms of sensation. A sensation of "pins and needles" is felt. On palpation it is found that the muscular paralysis is associated with a hard unelastic condition of the muscles. Ischæmic paralysis with obliteration of the artery has also been described but is not well known.

Makins believes it is too difficult to rule out a concomitant nerve injury of minor degree. In his opinion the differences in signs may be ascribed to varying degrees of local anæmia and are not reflex in character.

Sympathetic involvement with pupillary changes in cases of cervical rib is rare as the rami communicans are given off from the first dorsal root above the point of pressure. Ptosis, myosis, retraction of the bulb, and mydriasis may be present. Church reports a case in which the recurrent laryngeal was evidently involved. Such involvement is more apt to occur on the right side.

Schmidt suggests that pressure exerted by cervical ribs upon the cervical sympathetic ganglion may be a cause of symptoms of hyperthyroidism. Disturbances of the phrenic nerve associated with diaphragm convulsions have also been reported (Streissler).

#### VASCULAR SYMPTOMS

Vascular symptoms are usually arterial. Venous symptoms may occur in association with the arterial symptoms but are rarely present alone. In a series of 31 cases observed by Henderson there was only 1 case of œdema. Out of the total number of cases with vascular symptoms which were collected by Halsted some œdema was present in 29.4 per cent but only 5.3 per cent had vascular symptoms alone.

When the cervical rib extends in front of the subclavian artery or is replaced by a fibrous ligament the artery passes over it. In exceptional cases, however, the artery has been found between the sixth and seventh cervical ribs and between the cervical and first ribs (Streissler, Eisendrath). In these cases it was compressed. Wood Jones

believes that the cervical ribs usually terminate before reaching the artery.

Symptoms may be caused also by pressure upon the subclavian artery. Murphy believed that this artery was compressed between the cervical rib and the scalenus anticus muscle. Babcock suggests angulation of the artery due to the scalenus anticus and the cervical rib as a cause of the circulatory disturbance. He states that there is no tendency to the formation of a collateral circulation such as would be expected following ligation or continued obstruction. Osler also states that angulation plays a part in the production of symptoms in some cases.

Mechanical pressure may be a factor in conditions in which certain positions of the arm stop the pulse altogether. Seiffer noted that in some cases of cervical rib the pulse is weakened when the arm is lifted and that when the arm is raised to the vertical position the pulse is entirely absent (Streissler). In other cases the weakness of the pulse may be relieved by raising the arm above the head, and in all cases reported by Thorburn in which the rib was removed these symptoms were relieved.

Aneurism and some of the arterial symptoms may be the result of pressure.

Halsted has been able experimentally to produce a dilatation of the subclavian artery distal to a partially occluding band and believes that this fact explains the occurrence of enlargement of the artery in 21.6 per cent of 125 collected cases of cervical rib with vascular symptoms. Hamann states that the subclavian artery beyond the scalenus anticus frequently appears dilated. To obtain an explanation of some of the vascular symptoms it is necessary to review the work of Potts, Kramer, and Todd.

In this work it was found that the subclavian and axillary arteries receive a nerve supply directly from the sympathetic chain, a fact which accounts for their usual escape from involvement in lesions associated with a cervical rib. All of the other arteries in the upper limb obtain their nerve supply from sympathetic filaments which travel along spinal nerves and are distributed to various blood vessels at irregular intervals. The distribution of nerves to the vessels corresponds roughly to the distribution of the nerves to the muscles and skin. This explains the early involvement of arteries in the hand in types of cervical rib lesions in which vessels are affected. The distal and peripheral blood vessels were also found to receive richer nerve filaments.

The process by which the blood vessels are affected appears to be: first, a stimulation of the



vasoconstrictor fibers; second, paralysis of the vasoconstrictors; and third, pathologic changes in the vessel wall consequent upon the nerve lesion. Potts states that if absolute proof can be obtained of the relation between damage to the sympathetic supply of an artery and morphologic changes in the vessel itself of more than focal character, the nerve damage must occur at some distance from the arterial tree and not simply in the sympathetic plexus as it lies on the vessel.

Endarteritis in cervical ribs was found by Todd and has been produced experimentally by operations upon nerves in rabbits and dogs (Fraenkel; Byrvoets). Stopford compares uncomplicated nerve injury with endarteritis of the peripheral arteries with the late changes in cases of thermalgia or causalgia. In his opinion the vasomotor changes in the latter are due to a true irritative nerve lesion. Telford operated upon two cases of cervical rib in which there was neurovascular derangement. Operation completely relieved this progressive condition.

The vascular symptoms in cases of cervical rib usually begin in the fingers and spread upward. Only occasionally does obliteration of the arteries reach the subclavian (Keen). The interference with the circulation in the large arteries is not shared by the smaller arteries in every instance.

The early stage of the disease is described by Osler. In one of his cases he found that the radial pulse on the two sides seemed normal and equal during rest. After some exertion the pulse on the affected side became very small and only just perceptible and the arm became congested and cyanotic. From a study of this case it seemed that the lesion first stimulated the vasoconstrictors, the pulse becoming small, and later caused a paralysis with dilatation and lack of tone and consequent delay in the pulse. This delay has been shown by Cehanovic experimentally (Kramer and Todd). The changes in the arterial walls seem to be selective and often involve the larger peripheral vessels. The cause of this is unknown.

Weir Mitchell observed that "trophic" changes are most apt to follow wounds of the nerves to the hand or foot (that is, the lowest cord of the brachial plexus which contains the majority of the vascular nerves) and occur more rarely when the injury involves nerve branches which supply the upper portion of the limb.

The twig supplying the subclavian artery directly from the region of the ansa subclavia is not caught in the lesion of cervical rib because it

lies alongside the artery which is not locally damaged. In rare instances, however, it may be affected secondarily (Kramer and Todd).

#### THE DIFFERENTIAL DIAGNOSIS OF CERVICAL RIB LESIONS

Pressure upon the lower cords of the brachial plexus by a cervical or first thoracic rib should be suspected in any case of sensory nerve symptoms along the distribution of the lowest brachial cord, paralysis of the intrinsic muscles of the hand, vasomotor changes in the hand, and tumor or subclavian pulsation in the region of a cervical rib. A proper diagnosis can be made only after a careful neurological examination and with the aid of roentgenograms. Examination of the cervico-thoracic region with the X-ray shows normally that the transverse processes of the seventh cervical vertebra appear decidedly shorter than those of the first dorsal vertebra (Jones). The shape, however, must not be relied upon for a decision as to which rib is rudimentary. In some cases the X-ray diagnosis may be difficult as in the presence of a rudimentary first rib the second thoracic rib may assume the characteristics of the first.

Dupré and Todd state that whatever the radiographic appearance, there is no such thing as a true enlargement of the transverse processes of the seventh cervical vertebra. The so-called enlargement is in every instance a rudimentary rib.

There are no changes in the reflexes in cases exhibiting the symptoms of cervical ribs (Streissler). Stopford and Telford state that the greater loss of protopathic sensation as compared with the loss of epicritic sensation is characteristic of the nerve compression in cases of cervical rib. According to Thorburn, there is a dissociation of various forms of sensation as in other affections of the brachial plexus. The thermal sense, however, is most readily affected and the pain sense is more readily abolished than the sense of touch. This condition is apt to be aggravated also by cold. No very complete anaesthesia was present in any of his cases.

Streissler states that at times there is a disturbance of the cervical fifth and sixth roots and rarely of the posterior roots. The latter gives rise to symptoms in the neck and the back of the head. Todd reports a case in which stretching of the cervical fifth and sixth roots resulted from paralysis of the trapezius. Murphy states that it is hard to rule out primary peripheral lesions.

"Uniradicular paralysis" due to other causes can be distinguished with difficulty, if at all, with-

out a radiographic examination. The true pathology is unknown. Neuritis may be present and must be ruled out. Dana describes the common brachial neuralgias and arm pains. Muscular rheumatism and arthritis deformans must also be ruled out.

Didé and Courjou describe a hypertrophic neuritis in adults with atrophy of the muscles of the hands and arms. The onset of this condition occurs between the thirtieth and fortieth years of age. Complicating cerebellar symptoms are rare.

Symmetrical atrophy of the hands or "radicular paralysis" has also been described. Undoubtedly the symptoms in some of these cases were due to cervical ribs (Jones).

Some cases of cervical rib may closely simulate Raynaud's disease.

Aneurism must be ruled out and when present a cervical rib must be considered.

Disease of the spinal cord and its coverings should always be considered. Absence of oculopupillary symptoms and of evidence of an affection in the descending fibers of the spinal cord (exaggeration of reflexes, etc.) should suffice to exclude an affection of the spinal cord or its coverings.

The following diseases should be considered: syringomyelia, syphilis, tumors of the spine or cord, other pressure lesions, vertebral caries, pachymeningitis cervicalis hypertrophica, and poliomyelitis. The last named condition is ruled out by the presence of sensory changes.

Localized myositis ossificans, exostosis of the first rib (recognized by Syme 1853), disease of the rib, and tumor in this region occasionally may simulate a cervical rib but the X-ray will aid in eliminating many of them.

#### TREATMENT

Relief of symptoms associated with any anomalous or rudimentary rib, whether cervical or thoracic, or with even a normal rib depends upon many factors. If the symptoms seem to be due to a rib and there are no definite contraindications, radical removal should be considered. In cases of paralysis of the muscles elevating the shoulder, palliative treatment with local stimulation may be sufficient, but when there is progressive change intervention should not be delayed. Coote first resected a cervical rib in 1861.

The subperiosteal resection is preferred by some surgeons as it is associated with less danger of injuring the pleura and other parts. Regeneration of bone, however, may cause a return of symptoms following the use of this method.

The postoperative disturbances may be due to: (1) a bony new formation from the stump,

especially if subperiosteal resection is done (Jones); (2) injury to the pleura with emphysema or empyema; (3) aneurism; (4) injury to the plexus at operation causing increased paralysis and muscle wasting; and (5) acute neuritis (Lewis).

The nerve and blood-vessel symptoms as a rule gradually abate after resection of the rib but may persist a year or even longer.

Streissler reviewed the end-results in 71 cases. In 77 per cent the condition was cured; in 12 per cent, improved; and in 10 per cent, unimproved.

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# ABSTRACTS OF CURRENT LITERATURE

## GENERAL SURGERY—SURGICAL TECHNIQUE

### OPERATIVE SURGERY AND TECHNIQUE

**Kreider, G. N.: The Repair of a Cranial Defect by a New Method: Report of an Apparently Successful Case.** *J. Am. M. Ass.*, 1920, lxxiv, 1024.

A boy, aged 4½ years, was kicked over the left eye by a horse about 2 p.m., November 18, 1919. Examination two hours later revealed a lozenge-shaped compound fracture about 3 in. long and 1 in. wide, beginning near the outer border of the superciliary ridge and passing upward and backward over the frontal prominence almost to the median line. Two large pieces of bone were driven in, causing loss of considerable brain substance.

Under ether anaesthesia about 6 pieces of bone were removed. The 2 largest fragments were completely buried in a pocket in the left hypochondrium. The wound in the frontal region was thoroughly cleansed, packed with iodoform gauze, and closed except at the ends. Antitetanus serum was administered. On November 29 the gauze was removed under ether and the edges of the wound trimmed and brought close together. On January 7, 1920, a horse-shoe shaped incision external to the original wound was made. The edge of the dura was slightly dissected. The two fragments of bone were removed from their pocket and placed in their former position. A considerable layer of fat which had become attached to the outer surface of the fragments was utilized in sewing them into place. The flap was then brought back and closed with silkworm gut. Uneventful recovery followed.

The important fact which the author wishes to bring out is that very often it is possible to preserve fragments of cranial bones by implanting them in some other part of the body. LOUIS HANDELMAN.

**Melchior, E.: Secondary Enterostomy following Operations for Peritonitis and Ileus** (Ueber sekundäre Enterostomie nach Peritonitis- und Ileusoperationen). *Berl. klin. Wchnschr.*, 1920, lvii, 56.

The author reports 4 cases operated on at the Kuettner clinic. In all instances the secondary enterostomy proved a life-saving operation. Secondary obstruction is not due to inflammatory adhesions, kinking of the bowel, or pressure by neighboring abscesses, but is the result primarily of localized paresis of the bowel induced by numerous local injuries caused by strangulation, interstitial hemorrhages, compression of the bowel wall, and extension of the inflammation to the various layers of the bowel wall. Complete paralysis of a damaged part acts as a mechanical obstruction and in cases

of complete bowel paralysis even an enterostomy is of no benefit.

Using local anaesthesia if possible, the author opens the abdomen at the site of the greatest distention and sutures a medium-sized drainage tube into the lumen of the distended small bowel so that a fistula is formed similar to a Witzel fistula. In all cases this fistula has closed spontaneously after a short time. BODE (Z).

**Case, J. T.: A New Aid in the Early Recognition of Postoperative Ileus.** *J. Michigan State M. Soc.*, 1920, xix, 151.

In order to make the earliest possible diagnosis of postoperative ileus the author uses the X-ray as soon as symptoms of obstruction are observed.

With the bedside apparatus in present use the only manipulation necessary is in the placing of the plate-holder. No preparation is required. The plate is ready for examination in fifteen or twenty minutes. If the location of the obstruction is not clear, a barium enema may be given to rule out colonic obstruction. If this is insufficient and if the surgeon believes it permissible, ½ oz. of barium may be given by mouth. However, when the roentgenologist is experienced in the work, the administration of barium by mouth is unnecessary as he will be able to make a diagnosis from the appearance of the abdominal shadows with reference to the gas areas present. H. J. VANDEN BERG.

**Hampton, H. H., and Wharton, L. R.: Venous Thrombosis, Pulmonary Infarction, and Embolism following Gynecological Operations.** *Bull. Johns Hopkins Hosp.*, 1920, xxxi, 95.

Since Virchow's monumental work, thrombosis and embolism have held the attention of the pathologist, the internist, and the surgeon, and as a result a vast amount of literature has accumulated. The interest of the authors was aroused recently by several consecutive deaths from pulmonary embolism which constituted 50 per cent of the fatalities for the past year. It was quite evident to them from the onset that the prevention of embolism in their clinic, if attainable in any degree, would depend upon an accurate study of their cases of phlebitis and thrombosis. They therefore collected statistics regarding all the cases of phlebitis and thrombosis that had occurred since the opening of their clinic in 1889. About 40 of these cases have been previously reported by Clark and Schenck.

The authors had been compiling their statistics but a short while when they made the observation



that in the cases of many patients with phlebitis who later developed pulmonary complications a diagnosis of pleurisy or pneumonia had been made without any reference to the possibility of infarction. They found, moreover, that a certain number of their patients who had suffered from an unrecognized pulmonary infarction died later of pulmonary embolism.

The second half of their paper, therefore, they devote to the pulmonary complications associated with venous thrombosis. In doing this they endeavor to show that these conditions have often been overlooked, and they present the clinical data by which they may be recognized. These subjects are treated entirely from a clinical standpoint as no experiments were conducted upon either thrombus formation or infarction. Free use is made of the literature, however, and in practically all of the fatal cases the clinical findings were checked by postmortem examinations. Six of the authors' most interesting cases are reported. From their investigation they make the following conclusions:

Postoperative venous phlebitis and thrombosis were not peculiar to any particular type of gynecological operation.

A number of conditions favored thrombus formation. Of these, infection and trauma were the most important.

Perineal operations were not free from these complications.

Practically all cases of thrombophlebitis were associated with a slight rise in the temperature curve.

Phlebitis and thrombosis of the leg veins when associated with pain and swelling were rarely ever followed by fatal embolism.

Pulmonary infarction occurred most often in the same class of cases and during the same period of convalescence as femoral thrombophlebitis.

Pulmonary infarction sometimes preceded pulmonary embolism.

In the majority of cases postoperative pulmonary infarction has been unrecognized heretofore.

The diagnosis of postoperative pulmonary infarction was based on the clinical picture rather than the physical findings alone.

With proper care, pulmonary infarction can be diagnosed.

G. E. BEILBY.

#### ASEPTIC AND ANTISEPTIC SURGERY

**MacFarlan, D.: The Germicidal Value of Potassium Mercuric Iodide.** *Am. J. M. Sc.*, 1920, clix, 586.

Potassium mercuric iodide is a distinct chemical entity formed by the direct combination of two molecules of potassium iodide with one molecule of mercuric iodide. The potassium must be in excess to prevent conversion into the red iodide of mercury. Potassium mercuric iodide is readily soluble in water, alcohol, and acetone. It is less toxic than mercuric chloride and in dilutions for germicidal use is a safe wash for the mucous membranes. As much as 6 or 8 minims of a 1 per cent solution

may be taken internally without gastric irritation. On the hands the solution is not as irritating as bichloride of mercury. It does not precipitate proteins and experience has shown that human blood serum may dissolve 100 per cent of it without any appreciable coagulation or precipitation of the albumins, etc.

The germicidal action of potassium mercuric iodide is very effective, dilutions of 1:80,000 killing such organisms as *Bacillus typhosus*, *Staphylococcus aureus*, *Bacillus bulgaricus*, *Bacillus acidilactici*, and yeasts after twenty-four hours' exposure. It is more valuable than iodine on *Staphylococci*, *Bacillus coli*, and the spore-forming *Bacillus subtilis*.

Tests of the effect of different concentrations of potassium mercuric iodide on actively growing broth cultures incubated at 37.5 degrees gave the following results:

*Staphylococcus albus* exposed from three to sixty minutes to concentrations varying from 1:100 to 1:5,000 showed growth only in the tube exposed to the 1:5,000 solution for three minutes.

*Staphylococcus albus* exposed from one-half hour to twenty-four hours to dilutions varying from 1:10,000 to 1:100,000 showed growth in all tubes for periods of only one-half or one hour.

*Bacillus coli communis* exposed for periods varying from one to sixty minutes to dilutions varying from 1:100 to 1:5,000 showed no growth when the 1:100 dilution was used, growth for one minute only when the 1:500 dilution was used, growth for one or two minutes only when exposed to the 1:1,000 dilution, growth for one, two, three, four, and five-minute exposures when the 1:2,000 dilution was used, growth for one, two, three, five, and ten-minute exposures when the 1:3,000 dilution was used, and growth up to sixty minutes when the 1:5,000 dilution was used.

*Bacillus coli communis* exposed for periods varying from one-half hour to twenty-four hours to dilutions varying from 1:100 to 1:100,000 showed no growth when exposed to the dilution of 1:100, growth for only one-half hour when exposed to the 1:5,000 dilution, growth for one-half or 1 hour only when exposed to the 1:10,000 dilution, growth for one-half, one-, and two-hour periods when exposed to the 1:20,000 dilutions, growth for one-half, one, two, three, four, and five-hour periods when exposed to the 1:30,000 dilutions, and growth for one-half, one, two, three, four, five, and six-hour periods when exposed to the 1:40,000 dilutions. With other dilutions up to 1:100,000 there was growth up to twelve hours, but at the end of twenty-four hours all growth had ceased except when the 1:100,000 dilution was used, in which case the growth continued throughout the entire twenty-four-hour period.

*Bacillus subtilis* exposed for periods varying from three to sixty minutes to dilutions varying from 1:100 to 1:5,000 showed growth for only three minutes when the 1:100 dilution was used and growth for sixty minutes only when exposed to the 1:5,000 dilution. Exposure from three to sixty minutes to



the other dilutions up to 1:5,000 did not kill the growth. Therefore bacillus subtilis is less easily affected than some of the other organisms, this being due to its sporulation.

Bacillus subtilis exposed for periods varying from one-half hour to twenty-four hours to dilutions varying from 1:1,000 to 1:100,000 showed no growth after three hours when exposed to the 1:1,000 dilution, no growth after six hours when exposed to the 1:10,000 solution, and no growth after twenty-four hours when exposed to the 1:100,000 dilution. All other dilutions used for periods varying from one-half hour to twenty-four hours did not stop the growth.

These tests show that the 1:5,000 dilution is capable of destroying staphylococci in five minutes without irritation of the tissues, while dilutions varying from 1:100 to 1:500 destroy the sporulating bacillus subtilis and the bacteria of tetanus, anthrax, gas gangrene, and malignant oedema.

When to tubes containing 2 ccm. of different dilutions of the germicide sufficient human serum was added to give a coagulable protein content of 0.5 per cent (gravimetric method) the solutions remained perfectly clear after twenty-four hours.

R. R. MUSTELL.

**McKenna, W. F., and Fisher, H. A.: The Use of Potassium Mercuric Iodide for Skin Disinfection.** *Surg., Gynec. & Obst.*, 1920, xxx, 370.

Because it was believed to penetrate the follicles more readily than other disinfectants iodine has been the disinfectant of choice for use on the skin. It possesses certain drawbacks, however, as it may cause dermatitis and irritation of the periosteum. Moreover it is contra-indicated in cases of hyperthyroidism.

Experiments have demonstrated that a 1 per cent solution of potassium mercuric iodide in acetone will penetrate the epidermal layer but not the true skin, while iodine produces only a slight staining of the epidermal layer. The ability of the skin to absorb potassium mercuric iodide is shown by the fact that after the application of 1:1 000 solution the actual concentration in a given area will be 1:4,000. The disinfecting power of potassium mercuric iodide has also been proved. The effect of an application of 1:100 solution was compared with that of a similar application of a 7 per cent iodine solution and the germicidal effect of the potassium mercuric iodide solution was found to surpass that of the stronger iodine solution.

Potassium mercuric iodide solution in acetone possesses the added advantage of a solvent action on the natural fats and it dries very rapidly.

The application of a germicide must kill the bacteria on the surface of the skin, in the hair and sebaceous follicles, and in the sweat ducts. It must not, however, injure the tissues. A solution of potassium mercuric iodide in acetone, 1:100, or in 70 per cent alcohol penetrates by means of its solvent action, readily evaporates, produces no stain, and

causes no irritation or blistering of the skin. Therefore, in a 1 per cent solution in 70 per cent alcohol or in acetone, potassium mercuric iodide is preferable to iodine for disinfecting the skin before an operation.

R. R. MUSTELL.

## ANÆSTHESIA

**Ehrlich, S. D.: The Present Status of General Anæsthesia from the Hospital Point of View.** *Med. Rec.*, 1920, xcvi, 651.

The author claims that it is absolutely essential for the anæsthetist to be a physician—a physician who combines a general knowledge of medicine with a specialized knowledge of anæsthesia and the technique necessary for handling various apparatus. A general knowledge of medicine is indispensable for a thorough understanding of: (1) the physiology and pathology of the heart and blood vessels, the kidneys, and other organs; (2) metabolism and metabolic diseases—especially diabetes; (3) acid intoxication, the action of anæsthetics in inducing acidosis or aggravating it when already present, and the means of combating this condition; (4) the nature, causation, manifestations, prevention, and treatment of shock; (5) the various reflexes and their indications; and (6) the factors contributing to the patient's condition.

The large hospitals have begun to recognize the need for a visiting anæsthetist, a physician who devotes his time exclusively to the subject of anæsthesia. This work is of such importance that it should be accorded a department of its own with an established head to assume the responsibility and control. This director should hold a position on the medical board in the same capacity as the heads of the other departments.

The duties of the visiting anæsthetist should include the practical instruction of the internes assigned to anæsthesia service in the use of the various methods of administration which obtain in that particular hospital; the proper care and selection of the anæsthetic agents, their properties, advantages and disadvantages; pre-operative and postoperative care and treatment; and the keeping of careful records of all anæsthesias and of charts provided for the purpose. The staff member should also supervise the interne during routine work. When necessary, however, in difficult and serious cases, he himself should administer the anæsthetic.

At the present time the system of medical education is such that the student receives very little theoretical, and little if any, practical instruction in anæsthesia. The hospital should afford every interne the opportunity to supply this need by a regular course of anæsthesia of four to six months' duration, during which time he should be permitted to give all the routine anæsthesias under the supervision and instruction of the staff anæsthetist.

In view of the prerequisites mentioned a nurse is not fully competent to administer anæsthetics. She may be trained in the mechanical processes of



the administration and may have had even a few months' instruction in physical diagnosis, but this at best can give her only a superficial knowledge. The matured judgment which comes only with a thorough knowledge of medicine is lacking. She is no more qualified to do the work of an anesthetist than an operating-room nurse who knows the steps necessary to open an abdomen and remove an appendix is qualified to do the work of a surgeon.

The fact that nurses administer anesthetics in a few large clinics is by no means proof that it is a good thing either for the patient or for the institution. Indeed, a hospital which entrusts work of this nature and importance to a nurse assumes a grave responsibility. Justice to the patient demands that he be served with the utmost skill, not only in the mechanical administration of the anesthetic, but in the ability to cope with any emergency which may arise during the anesthesia.

ISABELLA HERB.

**Zueblin, E.: The Results of Ether Anesthesia on Suspected and Manifest Cases of Pulmonary Tuberculosis.** *Am. J. Surg.*, 1920, xxxiv, Anæst. Supp., 44.

Zueblin does not favor the Savage treatment—closed cone ether method—as in cases in which he has seen it used the improvement in appetite, cough, and expectoration claimed by Savage were either not noted at all or were merely temporary. He is convinced that in a large percentage of cases the onset of active tuberculosis closely followed a tonsillectomy, an appendectomy, or even a lesser intervention under a general ether anesthetic. In his opinion a general anesthetic should never be given without a most careful chest examination.

Investigations on the action of ether on the tubercle bacillus have demonstrated that it partially extracts the fatty constituents of the bacterium. Experience has shown that partial antigens may be very powerful. It is not impossible that a similar process takes place in a tuberculous focus during ether anesthesia and that the undesirable effects of the anesthetic may be due in part to the liberation of toxic substances.

Zueblin mentions the need for research on the effect of ether on the liver and other organs similar to that of Davis and Whipple regarding the effect of chloroform on the liver.

R. B. BETTMAN.

**Guedel, A. E.: Third-Stage Ether Anesthesia: A Subclassification Regarding the Significance of the Position and Movement of the Eyeball.** *Am. J. Surg.*, 1920, xxxiv, Anæst. Supp., 53.

It is not sufficient to know merely that the patient is in the third or surgical stage of narcosis. The anesthetist should be able to say at any time to just what part of the third stage the anesthesia has progressed. The latitude of third-stage anesthesia with ether is so great that the patient may be given more ether than necessary without immediate danger. Postoperative toxæmia, however, is in di-

rect proportion to the amount of ether administered. Light anesthesia, if acceptable to the surgeon, is therefore infinitely better than deep anesthesia.

Guedel divides the third stage of anesthesia into four strata and presents a chart correlating the various signs found in each.

The author believes that one of the most important signs in anesthesia is the condition of the eyeball. Aside from extraneous circumstances, such as positional asphyxia, hæmorrhage, and shock, the patient is safe and in good condition if the eyeball is moving or stationary but eccentric. As the patient enters the first or upper stratum of the third stage of anesthesia either from above or below, a partial paralysis of the *motores oculi* is manifest. There is an intermittent contraction and relaxation, a variation of these causing a rhythmical oscillation of the eyeball, or a stronger tonic contraction of one set than of another, resulting in a stationary but eccentric globe. Occasionally in alcoholic patients or persons with high reflex tension, a peculiar and slight twitch of the globe, usually in a lateral direction, will be noted. This twitch may not occur until from three to five seconds after the lid has been raised for inspection. The inspection therefore should not be momentary. When the twitch occurs, either late or early, it means that the paralysis of the *motores oculi* is only partial.

If a rhythmical oscillation, an eccentric stationary globe, or a twitching is noted, the patient has not had too much anesthetic and, other things being equal, the ideal stage of surgical anesthesia has been reached.

ISABELLA HERB.

**Ross, E. L.: The Effect of Atropine on Chloroform Hyperglycæmia.** *J. Pharmacol. & Exper. Therap.*, 1920, xv, 135.

A group of animals were anesthetized with chloroform and the increase in the blood dextrose was determined. Another group of animals were given atropine before chloroform anesthesia and the change in glycæmia was determined. The variation in the amount of sugar in the blood was not affected by atropine.

As it had been reported previously that atropine administered before ether anesthesia reduces the increase in blood sugar, a cause for this difference in ether and chloroform was sought.

The inhibition of respiration during the induction of anesthesia with ether was compared with that of chloroform. It was found that atropine did not alter the effects of either chloroform or ether. Chloroform caused more asphyxia by this phase of its action than ether.

The influence of ether and chloroform anesthesia on the heart rate as altered by atropine was measured. Atropine did not materially change the relations with either chloroform or ether. Chloroform caused a decrease in the heart rate about equal to the increase caused by the ether, approximately 5 per cent.



A series of tests was made of the effects of ether and chloroform in the blood upon liver glycolysis. It was found that neither of these anæsthetics had any influence on the rate of dextrose liberation from dead liver cells.

The relation of injury of the liver cells to the changes of dextrose in the blood was determined in cases of chloroform anæsthesia. In order to increase the injury to the liver cells the animals were fasted for a while before the chloroform was administered. It was found that with the increased liver injury the rise in blood sugar was decreased. The reduction in the store of glycogen which was associated with the increased injury to the liver by chloroform was found to be without effect as there was no alteration of ether hyperglycæmia through fasting.

The results of the experiments are summarized as follows:

1. Atropine administered before chloroform anæsthesia did not reduce the hyperglycæmia.
2. Atropine administered before ether or chloroform anæsthesia did not alter the changes in either the heart rate or the respiration.
3. Chloroform reduced the heart rate while ether increased it, a fact which has been observed by others.
4. Chloroform caused almost twice as much respiratory inhibition as ether.
5. A two-day fast decreased chloroform hyperglycæmia but did not affect ether hyperglycæmia.
6. Chloroform caused much more asphyxiation through respiratory inhibition and reduced heart rate than ether. This asphyxiation is the probable cause of a large part of chloroform hyperglycæmia and explains why this hyperglycæmia is not altered by atropine.

ISABELLA HERB.

**Pena Galarza: Spinal Anæsthesia in Gynecology**  
(La raquíanestesia en ginecología). *Rev. Ibero-Am. de cien. méd.*, 1919, xlii, 345.

In spite of the recent advances in gynecological surgery, the methods of diagnosis and the results obtained by operation, there is still hesitancy and often terror on the part of the patient when told that a general anæsthetic must be given. Often this fear is so great that she refuses to submit to an operation unless some other form of anæsthetic can be employed.

In laparotomies general anæsthesia is used both to overcome pain and to prevent all movement. In cases of benign affections however, such as those that may be treated by the vaginal route, other forms of anæsthesia may be employed. Because of the fear of ether and chloroform many women suffer for years from such affections as cystocele, rectocele, uterine prolapse, hypertrophied cervix, and other conditions causing frequent urination, dysuria, pelvic pain, fecal incontinence, tenesmus, leucorrhœa, weakness, etc. In such cases an attempt has been made to use a local anæsthetic but this has been found inefficient. Often it was necessary to finish the operation under ether or chloroform anæsthesia.

During the past three years spinal anæsthesia with novocaine has been used in all operations by the vaginal route with very satisfactory results. Only in 2 cases was there any considerable pain. The patient is usually able to recognize contact with the instruments but feels no pain. In 2 cases there was intense cephalalgia for a time, but this disappeared after the administration of large doses of aspirin. Intestinal paresis and paralysis of the legs lasted only for a few hours. The most serious complication was cardiac inhibition after the operation was begun on a woman of advanced age and very weak constitution. Injections of camphorated oil and caffeine brought on a reaction so that the operation could be continued. In this case it was thought that the patient was placed in the supine position too soon after the injection of the anæsthetic, thus allowing it to flow toward the bulbar region instead of toward the base of the spinal canal.

The technique is that usually employed in spinal anæsthesia, with certain minor modifications. Perfect sterilization of the instruments and solution injected is essential. The preparation is the same as that for a laparotomy. The injection is made between the third and fourth lumbar vertebræ. The solution of novocaine is made in 2 ccm. of serum, 10, 15, 20, and even 30 cg. of the drug being used, according to the duration of the operation. Before the injection is made a quantity of cerebrospinal fluid equal to the amount of solution to be injected is withdrawn. The patient is kept in the sitting position after the injection until formication in the legs is felt. The operation is begun about ten minutes later. The patient is then placed in the supine position with the head and shoulders somewhat elevated so as to form an inclined plane toward the pelvis. By this means the heavier liquid injected remains near the bottom of the canal and acts only upon the portion of the cord which distributes to the region of the operation. During the first few hours after operation quiet is often very important and is efficiently maintained by this method.

In conclusion the author recommends the use of spinal anæsthesia under the following conditions:

1. When the operation is to be performed by the vaginal route.
2. When because of a general condition or some functional defect in the organs of elimination, the patient is unable to tolerate ether or chloroform.
3. When the patient refuses to submit to an operation under a general anæsthetic. W. R. MEEKER.

**Wells, J. R.: Anhydrous Cocaine Spinal Anæsthesia.** *Ann. Surg.*, 1920, lxxi, 504.

Wells reviews the subject of spinal anæsthesia or analgesia giving the names of surgeons who have employed the method, the drug used, and the results.

From 1908 to 1914 in about 28,746 cases the mortality was not over 1 death in 1,200 cases. From 1915 to 1917 it was 1 in 16,000.

The advantages claimed for the method are: (1) perfect analgesia; (2) perfect muscular relaxa-



tion; (3) absence of postoperative shock; (4) absence of postoperative gastric disturbances; (5) absence of postoperative motor restlessness; (6) retention of consciousness; and (7) immediate resumption of gastro-intestinal activity if operative conditions permit.

The disadvantages are: (1) the retention of consciousness by highly neurotic patients; (2) a "sinking" sensation due to manipulation of the stomach which in turn causes psychic disturbances; (3) difficulty in controlling the dosage of the analgesic agent; (4) the fact that the agents for inducing spinal anaesthesia are not always readily obtainable and their administration is not as simple as that of general anaesthetics; (5) the possibility that the analgesia may not be complete because of inertia of the anaesthetic or its failure to enter the subarachnoid space. Complete or partial failure of analgesia, unilateral or delayed analgesia, occurs in from 4 to 9 per cent of cases.

The indications and contra-indications vary with different surgeons, the drug agent, the technique, and the experience of the operator. The indications recognized by surgeons who have had a sufficient number of cases to be capable of judging are: (1) cardiac conditions with or without broken compensation; (2) renal conditions, especially in the presence of impending uræmia; (3) pulmonary conditions other than acute febrile tuberculosis, large

pulmonary effusions, and large intrathoracic growths; (4) inguinal, femoral, and ventral herniæ; (5) shock, if the blood pressure is not too low or falling, especially shock arising from injuries to the legs or pelvis and severe burns; (6) acute abdominal conditions, including appendicitis with or without peritonitis, intestinal and paralytic obstruction; (7) reduction of dislocations; (8) operations on the anal region, urethra, bladder, prostate, uterus, and uterine appendages; (9) plethora, atheroma, and chronic alcoholism; (10) an acute operative condition developing within a short time after the ingestion of a full meal.

The contra-indications are: (1) low blood pressure (hypotension); (2) turbid spinal fluid; (3) diseases or tumors of the brain, cord, or meninges; (4) recent syphilis; (5) intrathoracic conditions such as very large effusions and large growths, especially mediastinal; (6) advanced toxic cases of peritonitis; (7) acute febrile infections, especially acute pulmonary tuberculosis; (8) general sepsis or suppuration near the point of spinal puncture; and (9) inability of the patient to stay in bed twenty-four hours after the operation.

Purified hydrochlorate of cocaine is the anaesthetic of choice. This cocaine should be used to the exclusion of other substitutes which are less active and less diffusible and which consequently necessitate stronger doses.

ISABELLA HERB.

## SURGERY OF THE HEAD AND NECK

### HEAD

**Sargent, P., and others: Discussion on the Surgery of the Pituitary Gland.** *Proc. Roy. Soc. Med.*, Lond., 1920, xiii, Sect. Surg., 35.

Lesions of the pituitary gland give rise to three groups of symptoms:

1. Those dependent upon disordered function, that is, excessive or deficient activity or a combination of both.

2. Those which result from an increase of the general intracranial pressure.

3. Those due to pressure upon neighboring structures, particularly the optic chiasm.

It is now commonly believed that gigantism and acromegaly are manifestations of an excessive activity of the pituitary gland, while infantilism, adiposity, and impotence result from deficient activity. There is thus an analogy between the functional disorders of the pituitary gland and those of the thyroid gland. In both cases the symptoms of excessive or deficient functional activity may merge. Cushing is the only surgeon who has operated in this condition. In one case he removed a portion of the pars anterior and in another he did a subtemporal decompression. In both instances the operation slightly alleviated the symptoms.

In cases with symptoms of increased intracranial pressure, pressure symptoms mark the beginning of

the terminal stage. A simple decompression will overcome the headache due to general intracranial pressure, but cannot be relied upon to relieve the "bursting" frontal pain caused by sellar distention. In cases which show papilloedema, subsidence of the swelling is to be expected after decompression. It is probable that simple decompression will prove to be a useful, if not an essential, preliminary to a frontal attack upon a pituitary tumor.

Hitherto, the pituitary region was subjected to surgical interference chiefly for visual disturbances. All of these cases show intracranial extension and Cope concludes that all pituitary tumors which come to operation for symptoms other than acromegaly have long before burst the bounds of the fossa.

The majority of tumors which arise in the pituitary gland appear to be of an adenomatous character, and are called by Cushing "chromophobe struma," that is to say, an adenomatous hyperplasia characterized by deficiency or absence of the eosinophile granules which seem to be associated with functional activity.

A large number of operative procedures to approach the pituitary fossa have been proposed and practiced. Such procedures fall into two groups: the extradural, including transpalatal, nasal, and paranasal operations, and the intradural, comprising temporal and frontal operations.

At present the two methods of approach which hold the field are the nasal and frontal. Of the former, the transsphenoidal operation of Cushing is probably the best. Of the latter, the orbito-frontal operation of Frazier is the most practical procedure.

In order to make a fair comparison between the two methods of operating upon pituitary lesions, not only the route of approach, but also what can be accomplished when the objective has been reached must be borne in mind. The nasal route is narrow and unclean, and the difficulties may be much increased by acromegalic deformity of the bones. Even under the most favorable circumstances there is very little room for dealing with a solid tumor and in cases in which there is an intracranial extension, only the smallest part of the tumor can be attacked. On the other hand, the frontal operation is free from the risks of meningeal infection and allows the intracranial portion of the tumor to be inspected and dealt with. Its chief dangers are injury of the frontal lobe and serious and fatal hæmorrhage from the stretched circle of Willis.

From the information available it would appear that the beneficial effects upon the vision of partial removal of a pituitary tumor through the nose or of merely allowing it to bulge downward into the sphenoidal sinus are uncertain, inadequate, and transitory.

The effect upon severe headache due to sellar distention is more uniform and may be very striking, but the condition tends to recur.

The author believes that whatever advance in pituitary surgery may take place in the future it will be the result chiefly of earlier and more accurate diagnosis, a better understanding of the objective in each case, and general improvement in the technique of the intracranial operation.

H. A. McKNIGHT.

**Rayner, H. H.: Trigeminal Neuralgia: Injection of Alcohol into the Gasserian Ganglion.** *Brit. J. Surg.*, 1920, vii, 516.

The author favors the treatment of trigeminal neuralgia by the injection of alcohol into the gasserian ganglion. The technique described by Hartel is followed closely. The needle, which is inserted near the angle of the mouth, is passed through the foramen ovale and the injection is made at a point not more than 1 to 1½ cm. beyond the entrance to the foramen. The chief objection to Hartel's method is that it does not permit restriction of the action of the alcohol to a particular part of the ganglion. The total amount of alcohol should not exceed 1 ccm. In cases which show total anæsthesia of the ophthalmic division twenty-four hours after injection the eye must be protected by goggles or suturing of the lids.

Although a general anæsthetic was given in the majority of cases, the author prefers the use of 1 per cent novocaine.

Of 3 patients treated by this method more than two years ago 1 has had a recurrence, but since re-injection has been entirely free from symptoms. There was no relapse in 5 cases in which the injection was given more than one year ago. Of 6 patients treated more than six months ago, 1 cannot be traced, 1 sought re-injection because of recurrence of symptoms, 3 are entirely free from neuralgia, and 1 suffers from "twitches" of pain in the bicuspid area of the upper jaw. Four patients treated less than six months ago are entirely free from neuralgia.

The author treated 2 patients who had neuralgia of the fifth nerve, non-epileptiform in character, by alcohol injection of the gasserian ganglion. No relief was obtained and 1 patient developed severe corneal ulceration. Rayner therefore concludes that simple neuralgias of this type are located in one of the neurons of the facial sensory tract above the gasserian ganglion and therefore treatment directed to the ganglion or the tract below must fail.

M. B. KELLOGG.

### NECK

**Davis, C. B.: Cervical Rib.** *Surg. Clin. Chicago*, 1920, iv, 269.

Seven cases of cervical rib, all relieved of symptoms by operation, are reported.

Cervical rib is found in 1 per cent of all bodies dissected in anatomical laboratories. The anterior portion of the transverse process of the seventh cervical vertebra is really a rudimentary cervical rib. This transverse process has two centers of ossification, one anterior and one posterior to the foramen for the vertebral artery.

Cervical ribs have been divided into false and true ribs. The latter articulate like the thoracic ribs. The former consist of merely a shaft. Four groups are described by Gruber:

1. Those extending into the neck with the distal end free.
2. Those articulating with the shaft of the first thoracic rib.
3. Those attached to the sternum with a cartilage common to the sternum and the first thoracic rib.
4. Those attached to the sternum by their own distinct cartilage.

Cervical ribs of Groups 1 and 2 are the most common. These ribs are more frequent in women than in men; more commonly bilateral than unilateral, and if unilateral, more frequently on the left side.

The chief symptoms are: (1) the presence of a visible or palpable tumor in the neck; (2) vascular phenomena; and (3) sensory and motor nervous disturbances.

Cold seems to influence the affected side. Cold water will sometimes cause ischæmia with great discomfort and blanching of the skin. Working with the arm in an elevated or extended position may also give rise to symptoms.



A cervical rib can usually be demonstrated by the X-ray. Occasionally similar symptoms may arise from fibrous or cartilaginous structures in the same location.

There are two methods of operative approach:

1. Incision through the muscles of the back down to and at right angles to the transverse processes of the vertebræ.

2. An angular or curved 3-in. incision, the lower half of which is parallel to and  $\frac{1}{2}$  in. above the clavicle, and the upper half parallel to the trapezius. In cases of first and second degree ribs it is unnecessary to carry the dissection forward sufficiently to expose the subclavian vein or to touch the phrenic nerve. The brachial plexus must be pushed forward and backward to expose the rib with as little displacement as possible. Injury to the suprascapular and spinal accessory nerves must be avoided.

The shaft of the rib with its periosteum must be removed to prevent recurrence.

In one case a portion of the first rib was resected and the vessels and nerves dropped into the cavity. This is a more dangerous operation.

Anæsthesia of the skin over the shoulder sometimes follows the operation, but disappears in a few months.

M. H. HOBART.

**Roeder, C. A.: Toxic Goiter following Epidemic Influenza.** *Surg., Gynec. & Obst.*, 1920, xxx, 357.

It is commonly believed that the nodular or adenomatous and hyperplastic goiters are frequently, if not always, caused by infection. The recent epidemics of influenza left more numerous and more varied complications than any other known infection. Among such complications were noted 8 cases of goiter, all developing rapidly and immediately following the infection. Of these 8 cases, 3 were adenomata which suddenly became very toxic. The toxæmia may have been present before the epidemic, although it was not noted. In the other 5 cases of hyperthyroidism the condition definitely followed the influenza.

Since this paper was written the author has observed 5 more cases of goiter following influenza, 3 of exophthalmic goiter and 2 of toxic adenomata.

I. W. BACH.

## SURGERY OF THE CHEST

### CHEST WALL AND BREAST

**Dalmazzoni S.: Observations on a Method of Operating for the Treatment of Purulent Pleurisy** (Osservazioni su un metodo d'intervento nella cura delle pleurit purulente). *Riforma med.*, 1920, xxxv, 1066.

More than 90 per cent of the operations performed by the author in 30 cases of purulent pleurisy were successful. The method of Schiassi was used. When radiography and puncture showed the presence of free exudate in the pleural cavity, an incision varying in length from 12 to 14 cm. was made near the tenth rib and after the insertion of an aspiration needle 3 or 4 cm. of the rib were resected. While the purulent fluid was being drained the cavity was explored by the inserted finger and another resection of 3 or 4 cm. of the rib was done. A gauze tampon was then packed lightly into the opening and left in place for thirty or forty hours to keep the edges of the wound apart. At the end of this period the gauze was replaced by rubber drainage tubes. No lavage of any kind was employed as the author considers such treatment useless and harmful. Recovery followed in from ten to twenty days.

W. A. BRENNAN.

**McGlannan, A.: The Management of Empyema.** *N. York M. J.*, 1920, cxi, 590.

At the present time the term "empyema" is used to signify a purulent exudate within the general pleural space. This exudate is limited only by the extent of the infective process and the condition therefore differs from intrapleural and intralobar abscesses which are local collections of pus walled

off by adhesions. In planning the treatment the surgeon must seriously consider the nature of the infection and its effect especially on the heart and great blood vessels.

The effect of a pleural exudate varies. Asserson and Rathbun consider the development of an effusion as an attempt on the part of nature to resist the infection and give comfort by keeping the inflamed pleural surfaces apart. In most cases the exudate disappears with the subsidence of the pulmonary inflammation, but occasionally it persists in the form of an empyema. Streptococcic exudates should never be drained while the pulmonary infection remains active. Careful aspiration in case of respiratory embarrassment is all that is necessary. Pneumococcic empyema is nearly always a sequel to pneumonia and therefore invariably becomes a surgical problem. In the cases reviewed the average duration of illness before operation was thirty-three days and the operative mortality about 14 per cent.

The operation was done in most instances under procaine anæsthesia. About  $1\frac{1}{2}$  in. of the seventh rib were removed subperiosteally, the section being begun in the mid-axillary line and extended backward. Mattress catgut sutures were put through the muscle on either side of the wound and left long to be tied later. The pleural cavity was aspirated with a needle passed through the space made by the removal of the rib. The tension in the pleural space having been reduced by the aspiration, the needle was withdrawn and the pleura incised. The blade of the knife was followed by the index finger which filled in the opening as fast as it was made, thereby

limiting the passage of air into the pleural cavity. With the finger in the pleural cavity adhesions were broken up until the lung was felt expanding on inspiration. The finger was then withdrawn, the Brewer tube quickly inserted, and the expanding inner flange drawn against the opening. The mattress sutures were then drawn up and tied, the skin was closed, and the outer flange brought down tight over a single layer of four-ply gauze. The patient was put to bed and the end of the Brewer-McHenry tube connected with a drainage container and a disinfectant reservoir. The clamp which had been previously applied to the Brewer tube was then removed and the pus allowed to flow out under the water into the container. The end of the drainage tube being under water, no air could enter the pleural cavity and at the same time the syphonage produced a mild negative pressure. The amount of pus drained was measured.

Two hours later a quantity of disinfectant equal to one-half the volume of pus removed was allowed to flow into the chest slowly from the reservoir (the patient being turned on the normal side) and was drained off again in half an hour. This procedure was repeated every two hours during the day and every six hours during the night and was continued until no more than 75 ccm. of the disinfectant could be introduced into the chest. If at this time stereoscopic views showed equal expansion of the lung, the Brewer tube was removed and the patient was given a blow bottle to aid in lung expansion.

In children it is not necessary to resect a rib. A soft rubber catheter passed into the pleural cavity through the cannula of a trocar and connected with a drainage apparatus will answer the purpose.

The method described not only spares the patient from the discomfort of pus-soaked dressings but maintains a constant negative pressure in the pleura, thereby preventing the distress of pneumothorax and actively aiding expansion of the lung.

LOUIS HANDELMAN.

#### PHARYNX AND ŒSOPHAGUS

**Langmead, F.: Notes of a Case of Œsophagectasis in an Infant, with Radiograms.** *Proc. Roy. Soc. Med.*, Lond., 1920, xiii, Sect. Dis. Child., 43.

The author describes a very interesting case of œsophagectasis in an infant. The patient, a full-term baby, weighed 4 lb. at birth. Before her first feeding she vomited and retched.

The bowel movements were greenish. The vomiting occurred about an hour after meals and was not of the projectile type. After the fourth month it was not so frequent, but there was persistent constipation and the stools were hard and small.

After being fed, the child appeared quiet, pale, and in collapse, but on vomiting regained her color. At fifteen months she weighed 14 lbs., 5 oz.

The family history was negative, three other children being normal. Soon after admission to the

hospital an X-ray showed a central dilation of the œsophagus about the size of a hen's egg. Some food passed through, but most of it remained in the dilated œsophagus. An attempt was made to pass a  $\frac{1}{8}$  in. tube into the stomach, but it curled back into the sac on reaching the lower end. The child continued to lose weight. The œsophagoscope, which was passed freely into the stomach under anæsthesia, revealed no organic lesion.

In the author's opinion the dilatation was produced by the failure of the cardia to relax.

R. R. MUSTELL.

#### MISCELLANEOUS

**Janeway, H. H.: The Treatment of Malignant Tumors of the Thymus Gland by Radium.** *Ann. Surg.*, 1920, lxxi, 460.

The author contends that malignant new growths of the thymus gland occur more frequently than is generally supposed, and therefore such growths should be borne in mind in the diagnosis of early thoracic affections.

A favorable result in the treatment of these tumors depends not only upon early diagnosis and treatment, but quite as much also upon the variety of the tumor treated. Ewing states that pathologically these tumors fall into the following groups: (1) lymphosarcoma, composed of a diffuse growth of round polyhedral and giant cells; (2) carcinoma, in which the main tumor cell is a pavement, cubical, or, rarely, a cylindrical epithelial cell; and, very rarely (3) spindle-cell or myxosarcoma which is believed to arise from the stroma of the gland.

The first symptom is usually cough without expectoration or hæmoptysis. The cough may be associated at first, or very early in its course, with dyspnœa. In the beginning the condition is usually regarded as a tuberculous process of the lung. In the majority of cases of lymphosarcoma of the thymus metastases extend into the lung and pleura. The very malignant cases metastasize early in their course. Extension through the anterior wall of the chest or through the sternum is characteristic.

Enlargement of the axillary lymph nodes may occur before involvement of the cervical nodes. Such rapid enlargement and extension to the axillary nodes suggests lymphosarcoma of the thymus. As the disease progresses, the dyspnœa becomes extreme, the infiltration into the lung and pleura increases, hydrothorax develops, the heart becomes displaced, and the large intrathoracic vessels, trachea, and bronchi become seriously compressed with consequent cyanosis and venous congestion of the upper chest, neck, and head.

In all cases X-ray examination is of the utmost importance in the diagnosis.

Radium offers relief to patients with this disease and in certain instances even a prospect of cure. Every effort should be made to treat the condition with radium during an early stage.

H. A. MCKNIGHT.



**Heublein, A. C.: Radium Treatment of Enlarged Thymus Glands in Infants.** *Am. J. Roentgenol.*, 1920, n.s. vii, 191.

Enlargement of the thymus gland is a comparatively common affection in infants and in a great many cases the direct or indirect cause of sudden death. The condition may be recognized easily from the history, physical examination, and roentgenogram. Up to a little more than two years ago roentgen therapy was believed to be the only effective method of treatment. At that time the author used radium on a well-defined case, partly as an experiment and partly because of the observation that radium caused a more rapid diminution in the size of other pathologic overgrowths. As the result was so eminently satisfactory he has treated all other cases in the same way.

The technique followed was crossfiring with 100 mg. of radium element filtered through 0.3 mm. silver at  $\frac{1}{2}$  in. skin tube distance through four portals of entry, the tube being placed over the anterior aspect of the chest directly over the thymus gland. The tube was left two hours in each position, making a total dosage of 800 mg. hours. However,

as time is such an important factor in these serious cases, Heublein now uses 200 mg. with half the time of exposure.

In his series of 41 cases the dosage administered seemed to be sufficient to cure large as well as small thymic overgrowths in one application, and as it has been proven conclusively that the thymus has no function after birth, there need be no fear of over-treatment. In none of the author's cases was there any tendency to regeneration of the gland. Possibly these results could have been obtained by a single intensive X-ray treatment, but no such results have been reported in the literature. Radium as well as the roentgen ray is specific in its effect, but radium has the following advantages: it is portable; it gives the desired result in one treatment; its use is simple and therefore the dangerous element of fright which causes infants to resist the fixation necessary in roentgen-ray treatment and which may be the exciting cause of thymic crisis and death is eliminated. In addition the procedure is safe as the skin tube distance never varies even in the treatment of a very refractory child. Detailed reports of four cases are given. ADOLPH HARTUNG.

## SURGERY OF THE ABDOMEN

### ABDOMINAL WALL AND PERITONEUM

**Steward, F. J.: A Clinical Lecture on the Treatment of Septic Peritonitis.** *Brit. M. J.*, 1920, i, 527.

In his discussion of the causes and treatment of septic peritonitis the author states that if the diagnosis and therapy were based upon a knowledge of the cause the death rate would be appreciably decreased. The term "spreading peritonitis" he believes is more accurate than the term "general peritonitis."

The presence of a large amount of highly toxic fluid in the peritoneal cavity is a result of septic infection and brings about a severe toxæmia associated with vomiting and often with paralysis of the bowel. The course of the condition depends upon the completeness of the removal of this fluid and the treatment of the associated dehydration and threatened ileus. The removal of the exciting factor (e. g., the appendix) is advisable if the danger is not increased thereby.

Special emphasis is placed on the importance of thorough drainage. Simple tube drainage should be downward. If this is impossible, a gauze wick may facilitate drainage but care must be taken to see that it does not hinder it. In severe cases the author employs continuous irrigation with saline solution by means of Carrel tubes. Several tubes are introduced into the abdomen and one of them is led to the pelvis. A large-bore drainage tube is also led to the pelvis and fixed to the skin. Partial closure and light gauze packing complete the operation. The patient is then placed in the Fowler position

on a padded bedpan and warm saline solution is allowed to flow into the wound at the rate of about a drop per second for a period varying from three to six days. The pelvic Carrel tube is left in place for several days after the others have been removed. To offset the loss of fluid due to vomiting saline solution given subcutaneously and by rectum is of value. When there is much distention and when, after operation, attempts to relieve the paralysis fail, puncture and evacuation of the gut are indicated. Puitritin and later turpentine enemas may also be tried.

By means of warmth, rest, saline solution, and small doses of morphine and atropine the patient may be revived to such an extent that he may be able to withstand an operation which otherwise would be impossible. In this connection the author states that in toxic cases he does not favor spinal anæsthesia.

The treatment must be based upon the requirements of the particular case. In early cases of perforating ulcer the abdomen may be closed after it has been flushed with saline solution. A primary closure may be made also in some cases of appendicitis with peritonitis but only if the patient is young and vigorous. In other cases gauze drainage is necessary for a few days.

Case histories which demonstrate the application of continuous irrigation are given. Three recoveries in 4 cases of extensive peritonitis resulted in from four to twelve weeks. The administration of morphine should be avoided when possible. The author recommends 10 gr. of medinal or  $1\frac{1}{2}$  gr. of dial.



Cardiac failure as a complication of septic peritonitis is most intractable. When local collections of pus are found the author advocates temporizing unless immediate evacuation is necessary as in some instances these collections have been absorbed.

J. W. Ross.

**Foerster, A.: Disturbance of the Excursions of the Diaphragm in Peritoneal Tuberculosis and Paranephritis as Determined by the X-Ray** (Ueber roentgenoskopisch-feststellbare Zwerchfellbewegungsstörungen bei Bauchfelltuberculose und Paranephritis). *Muenchen. med. Wchnschr.*, 1920, lvii, 38.

Jamin and Schuermeyer found that many abdominal conditions, such as enlargement of the liver, hydronephrosis, ascites, tumors, etc., are associated with a unilateral or bilateral elevation of the diaphragm without a marked change in its respiratory excursion. Jamin has observed an elevation of the diaphragm without change in its convexity but with a decrease in the size of the costophrenic angle and immobility during respiration only in cases of subphrenic abscess.

Foerster investigated the conditions in peritoneal tuberculosis. When the patient was rayed dorso-ventrally in the standing position flattening of the convexity and apparent obliteration of the sinus phrenocostalis were observed in addition to equal bilateral elevation of the diaphragm. The respiratory excursions were markedly decreased. Foerster considers these bilateral phenomena as characteristic of peritoneal tuberculosis. When they are unilateral, they indicate paranephritis. Acute and chronic conditions of the gall-bladder and severe forms of appendicitis and pyelitis did not present this picture.

The elevation of the diaphragm is due to the increase in the abdominal contents. In cases in which the abdominal pressure is increased, as in meteorism, the convexity of the diaphragm is not decreased and in inflammatory paresis of the diaphragm and reflex paresis due to pain the sinus phrenocostalis is not obliterated. The usual behavior of the diaphragm in cases of subphrenic abscess is probably due entirely to the mechanical conditions below it.

KEMPF (Z).

#### GASTRO-INTESTINAL TRACT

**Kerley, C. G.: The Roentgen-Ray Demonstration of Abnormalities of the Gastro-Intestinal Tract in Children.** *Am. J. Dis. Child.*, 1920, xix, 277.

Roentgen-ray studies were made of 66 cases of chronic gastric and intestinal disorders in children from 3 months to 15 years of age. The following abnormalities were found: megacolon with dilated sigmoid and marked stasis; acute pylorospasm with gastric retention; elongated sigmoid causing constipation; a triple sigmoid with diarrhoea from a chronic mucous colitis following prolonged con-

stipation; elongated sigmoid with pylorospasm, gastric retention, and recurrent vomiting; angulated sigmoid with pylorospasm, gastric retention, and marked constipation; enlarged sigmoid and wandering stomach with pylorospasm, gastric retention, and constipation; gastro- and coloptosis with poor appetite and malnutrition; and gastro- and coloptosis with recurrent vomiting and malnutrition.

From this study it was learned that persistent gastro-intestinal derangements affecting the immediate after-life of the patient may be dependent entirely on mechanical agencies. Periodic vomiting may be the result of dilation or ptosis of the stomach with retention. A capricious appetite may be due to defective emptying of the stomach. Unquestionably there is a relation between the emptying time of the intestine and that of the stomach, and stasis in the former is associated with defective emptying of the latter. A ptosed stomach or colon which does not give rise to symptoms is rare. On the other hand not all elongated sigmoids produce symptoms; even constipation may not result, provided there are no sacculations, adhesions, or relaxed abdominal muscles.

As regards the management of these cases, it was found that the most useful corrective agent for all types of abnormalities, both of the stomach and of the intestine, is a well-adjusted abdominal belt. When there is delayed emptying of the stomach, only three meals daily should be allowed. These should be given at as long intervals as possible, with very little fluid, and should be followed by rest. Abdominal massage and certain drugs were also found to be of much benefit. ADOLPH HARTUNG.

**Goldbloom, A., and Spence, R. C.: The Prognosis in Operated Cases of Hypertrophic Stenosis of the Pylorus.** *Am. J. Dis. Child.*, 1920, xix, 263.

The authors report the results of a study of 163 cases of hypertrophic stenosis of the pylorus in babies treated surgically.

One hundred and thirty-one children recovered and 32 died, a mortality of 19.63 per cent.

The conclusions drawn are as follows:

1. The duration of symptoms prior to operation is probably the most important single factor affecting the prognosis. When the symptoms have been present for less than four weeks, the mortality is only one-third as great as when they have continued for four weeks or longer.

2. The mortality among artificially fed babies is more than three times that among breast-fed babies.

3. Among infants weighing 7 lbs. or less, the mortality is three and one-half times as great as that among babies which weigh more than 7 lbs.

4. The mortality increases in direct proportion to the weight lost previous to operation.

5. The mortality among breast-fed infants who have vomited for less than four weeks and have lost less than 20 per cent of their best weight is almost nil. The fatalities which occur in such cases are due to avoidable accidents.

P. M. CHASE.



**Reeves, T. B.:** A Study of the Arteries Supplying the Stomach and Duodenum and their Relation to Ulcer. *Surg., Gynec. & Obst.*, 1920, xxx, 374.

At operation practically all ulcers of the stomach are found along the lesser curvature. Ninety-eight per cent of the duodenal ulcers brought to operation at the Mayo Clinic are found within  $1\frac{1}{2}$  in. of the pylorus, the greater number of these being on the anterior wall. In order to determine whether or not there is any difference between the character of the arteries which supply these regions of the stomach and duodenum and those which supply the remainder of the organ, the author studied 62 human stomachs, most of which had been injected with slightly acid gelatin-carmin solution prior to their removal.

Reeves reviews the anatomy of the arteries supplying the stomach and describes the arteries to the gastric submucosa. A decided difference is noted between the arterial plexus in the submucosa of the lesser curvature and that of the submucosa of the remainder of the stomach. The arteries of the former are much smaller than, and almost twice as long as, similar vessels in other parts of the stomach, and make few anastomoses.

The submucous plexus gives off two systems of branches; one passes to the muscular coats, the other to the mucous coat. The system of vessels to the mucous coat is rather complicated; the arteries proceed in a slanting, tortuous, spiral course toward the muscularis mucosæ. As the stomach becomes distended with food the tortuosity is lessened and a fuller blood supply to the mucosa is gained during the digestive activity. It is found, however, that there are two permanent folds, one along either side of the lesser curvature. These do not disappear on gastric distention.

The first  $1\frac{1}{2}$  in. of the duodenum receives its blood supply chiefly from the supraduodenal artery, which is given off by the gastroduodenal or hepatic artery. The submucosa of this part of the duodenum contains very few arteries in comparison to the other parts. This is especially notable on the anterior surface. These anatomical facts may explain the "anæmic spot" described by Mayo, which is usually seen on the surface of the bowel in this region when its wall is under tension.

Hæmatogenous infection has been considered by many investigators as a potent etiological factor in the production of gastric and duodenal ulcer. Virchow was among the first to point out that a thrombosis or other vascular lesion producing obstruction of the vessels in the gastric mucosa results in a hæmorrhagic necrosis. In the presence of gastric juice this tends to cause the formation of an ulcer. In the area of predilection for ulcer formation the blood supply is not so free as in the other parts of the stomach as the arteries are smaller and longer and make fewer anastomoses. The fact that permanent folds along the lesser curvature of the stomach remain even during

gastric distention tends to make the blood supply of the area relatively less than that of the remainder of the stomach during digestive activity. The small arteries of the submucosa of the first portion of the duodenum are comparatively few in number, make few anastomoses, and similarly predispose to circulatory disturbances which may lead to thrombosis. Therefore, since the vessels in these regions are liable to be occluded by emboli, it is reasonable to suppose that they are an important factor in the production of ulcer by hæmatogenous infection.

G. S. FOULDS.

**Hurst, A. F.:** New Views on the Pathology, Diagnosis, and Treatment of Gastric and Duodenal Ulcer. *Brit. M. J.*, 1920, i, 559.

The author holds that the shape and position of the stomach are important factors in the incidence of gastric and duodenal ulcer. One type of stomach predisposes to gastric ulcer, the other to duodenal ulcer, if certain exciting causes are present. In the normal stomach, however, these causes are inactive. Duodenal ulcer develops in connection with high-lying, hypertonic stomachs which generally show hypersecretion and empty rapidly. Gastric ulcer occurs in hook-shaped, hypotonic, slowly emptying stomachs which generally show hyposecretion, although in some instances they show hypersecretion.

Erosions and ulcerations are due to the action of the gastric juices on areas of lowered vitality. Bacterial toxins from septic teeth or diseased appendices often are responsible for this reduced resistance. Chemical irritants, such as alcohol, vinegar, and mustard, also may irritate the mucosa to such an extent that its resistance is lowered. Hard, indigestible, insufficiently masticated food rubbing against the delicate mucous membrane causes minute erosions which may be the starting points of ulcers. The author holds that although these various exciting causes are fairly common, they produce ulceration only in persons who have either a hypotonic or a hypertonic type of stomach. The hypotonic or slowly emptying stomach with its high acidity permits exceptionally strong gastric juice to remain in contact with the gastric mucous membrane for an unusually long period. In the hypertonic or duodenal-ulcer type the first part of the duodenum is filled constantly with strongly acid chyme; even when the stomach is empty, undiluted, highly acid gastric juice pours through the pylorus.

There is a class of patients with stomachs of the potential ulcer types who have had moderately severe ulcer symptoms over short periods of time, but who do not present the typical X-ray picture of ulcer. The author believes that these patients are in a pre-ulcerative stage which will undoubtedly progress to actual ulceration unless the exciting causes are removed. Septic foci in the mouth and nasopharynx should be eradicated and, if diseased, the appendix should be removed. The patient should masticate his food thoroughly and take





Fig. 1

Fig. 2

Fig. 3

Fig. 1. Average normal stomach.

Fig. 2. Hypertonic type of normal stomach.

Fig. 3. Hypotonic type of normal stomach.

nothing that is chemically or thermically irritating to the stomach. A little well diluted whisky is permissible with meals.

Three meals a day are sufficient for the type of stomach which empties slowly. Patients with rapidly emptying stomachs may take light lunches between meals and should have a tablespoonful of olive oil before meals to delay the evacuation; they may also take alkalis to neutralize the acidity. Exposure to sudden changes of temperature should be avoided and the bowels should be kept regular with paraffin.

In cases of actual ulceration the author employs a modified Sippy treatment which reduces the secretion of the gastric juice and keeps the hydrochloric acid constantly neutralized. The treatment is continued until the patient has had no spontaneous pain for three weeks and no evidence of active ulceration is found by X-ray examination.

The author holds that operation is indicated in cases of pyloric obstruction without symptoms of active ulceration, gastric ulcer with hour-glass contraction, recurrence of ulcer symptoms after thorough medical treatment, severe repeated hæmorrhage, and when malignancy is suspected.

A. J. SCHOLL, JR.

**Struthers, J. W.: Perforated Gastric and Duodenal Ulcer; 90 Cases.** *Edinburgh M. J.*, 1920, n.s. xxiv, 248.

The author's study is based on 72 cases of duodenal ulcer and 18 cases of gastric ulcer. Struthers has operated upon and has seen operations upon a greater number of cases of perforated ulcer than cases of ulcer before perforation or the development of other dangerous complications. In nearly every fatal case the death followed an operation performed after perforation had taken place. Twenty of the 90 patients died.

Treatment by dieting, drugs, and rest in bed had been tried in 54 cases, but usually was only partially or temporarily successful. Of the remaining 36 cases some were cases of rapidly progressing ulcers in which perforation was the first indication of trouble.

Of the 54 patients who suffered with severe dyspepsia the majority were men between the ages of 20 and 55 years belonging to the industrial class, and except for their dyspepsia were able-bodied.

Of 147 cases of gastric ulcer and 63 cases of duodenal ulcer treated on the medical service at the Royal Infirmary during 1913-14, 31 cases of gastric ulcer and 23 cases of duodenal ulcer were referred to the surgical service.

In cases of gastric and duodenal ulcer which do not yield promptly and permanently to medical treatment, the patients should be subjected to operative treatment at an early stage of their malady.

C. R. STEINKE.

**Sherren, J.: The Late Results of the Surgical Treatment of Chronic Ulcers of the Stomach and Duodenum.** *Lancet*, 1920, cxcviii, 691.

The author reviews in detail the postoperative conditions after a lapse of two years in cases operated upon for chronic gastric or duodenal ulcer.

A gastrojejunostomy should be done in the cardiac portion of the pyloric end of the stomach and should be between 2½ and 3 in. in length. More rapid emptying of the stomach and a decrease in the gastric acidity which this operation generally insures are points in its favor.

Test meals were given 174 patients both before and after gastrojejunostomy. The normal acidity was found to be: free HCl, 0.08 to 0.12, total acidity, 40 to 50. The gastric acidity was lowered in 159 cases. In 99 instances free HCl was absent and the total acidity was below 30. The most marked reduction followed an anastomosis near the cardiac end of the stomach. In 26 cases in which the gastric acidity was determined between four and nine years after operation the acidity was not so effectually lowered. The author does not favor pyloric exclusion.

Stricture of a gastrojejunostomy opening is due to marginal ulceration which in turn is generally the result of the use of unabsorbable catgut. In 769 cases (477 cases of duodenal ulcer and 292 cases of gastric ulcer) which were treated by gastrojejunostomy the author has had to reoperate in 7 cases because of stricture in the opening (2 cases of duodenal ulcer, 5 cases of gastric ulcer). Vomiting on the ninth or tenth day indicates that some mechanical change has taken place in the region of the anastomosis.

The author has operated on 31 cases of gastrojejunostomy. Twenty-seven of these operations followed a gastrojejunostomy for duodenal ulcer. Only 2 of the patients were women. Of 300 patients with duodenal ulcer treated surgically, 50 were women, while of 300 with gastric ulcer, 108 were women. Gastric acidity is lower in women than in men and lower in gastric ulcer than in duodenal ulcer.

Dilatation of the jejunum has been uncommon in the author's experience. Paterson found that in 73 per cent of cases in which there were complicating ulcers the symptoms began within two years after the operation. In the author's 31 cases recurrence of symptoms developed within eighteen months in 30 cases. The average period before the recurrence



of symptoms was nine months in cases of jejunal ulcer and twelve months in cases of gastrojejunal ulcer. Pain on the left side is the most prominent symptom. In all the cases of jejunal ulcer perforation had taken place and the floor of the ulcer was formed by either the mesocolon or the colon. Five of 13 jejunal ulcers had perforated into the colon. The prominent symptoms in such instances are diarrhoea and a low gastric acidity. Bleeding is unusual.

If secondary ulceration is suspected, medical treatment may be tried, but if no relief is obtained shortly, a second operation should be performed. If the ulcer is marginal it should be excised and all suture material removed. If there is contracture of an anastomosis opening, the opening should be reformed, and if jejunal ulcer is present the anastomosis should be excised with the ulcer and both ends of the jejunum implanted separately into the stomach.

It is possible that carcinoma may develop at the site of an ulceration around an anastomosis.

In 389 cases of chronic duodenal ulcer the ulcer involved the stomach in 2 and a separate ulcer was present on the lesser curvature in 7. There were 9 deaths in this series, 3 being those of patients among the 35 operated on for hæmorrhage. The causes of death were continued bleeding from the ulcer, pulmonary embolism, bronchopneumonia, and regurgitant vomiting.

Three hundred and seventy-nine patients were treated by gastrojejunostomy with or without involvement of the ulcer. In 2 cases the ulcer was excised; in 1 case simple excision of the ulcer was done. In 5 cases a partial gastrectomy was performed and in 2 a double gastrojejunostomy.

In postmortem observations made in cases in which a gastrojejunostomy for duodenal ulcer had been done the original ulcers were often found healed.

The author has been able to trace 348 of 389 patients after a two-year period. Three hundred and eighteen, including all those treated by partial and double gastrojejunostomy, have been perfectly well. Two died of some other condition. The after-history of 30 is unknown. Nineteen developed secondary ulceration and in 1 case this was fatal. Two had jejunal ulcers. Eighteen were operated on subsequently and 4 died soon after operation. One died within eight years.

In the author's practice no ulcers of the anastomosis line have occurred since the abolishment of linen sutures. He does not believe that carcinoma may develop from duodenal ulcers but has operated on 9 patients with carcinoma of the duodenum.

The successes following the operative treatment of duodenal ulcer are a little more than 80 per cent. Moynihan reported successes in 82.78 per cent of 305 cases operated upon.

In the treatment of gastric ulcer the choice of operation can be decided only from the factors governing the individual case. In 310 cases of chro-

nic gastric ulcer treated surgically there were 11 deaths.

On the whole, the cases of partial gastrectomy, combined gastrojejunostomy and excisions, and gastrojejunostomy alone have been successful. Three of the patients on whom a simple gastrojejunostomy was done died of carcinoma of the stomach seven, five, and four years after operation. Six of 35 ulcers removed showed carcinoma.

Of 80 patients with hour-glass stomach who were operated on, 4 died. The operations and mortality were: partial gastrectomy, 49 cases, 3 deaths; simple gastrojejunostomy, 26 cases, 1 death; and double gastrojejunostomy, 5 cases, no deaths. All of the patients who survived are well.

Seventy-five per cent of the patients with gastric ulcers who were operated on have remained well for the two-year period.

The author concludes that when the ulcer erodes the pancreas or invades the stomach gastrojejunostomy with excision is the operation of choice in cases of duodenal ulcer, and partial gastrectomy is the operation of choice in cases of gastric ulcer.

J. A. H. MAGOUN, JR.

#### Wendel, A. V.: Some Observations on the Post-operative Morbidity of Gastric and Duodenal Ulcer. *Am. J. Surg.*, 1920, xxxiv, 101.

Collective statistical records show an average of 50 per cent of symptomatic failures in operations for gastric ulcer.

Because of the fact that many medical men believe that ulcer of the mid-alimentary tract is a condition rarely requiring surgical aid, temporizing measures are continued until such extensive anatomical changes have taken place that operations of the first magnitude are necessary.

Of 162 cases of postoperative morbidity in ulcer, 112 were operated upon from five to thirty-one years after the diagnosis was made, and 39 immediately afterward. Symptomatic failure in the 39 cases was due probably to premature surgical treatment or insufficient medical treatment. A large percentage, estimated by some as high as 80 per cent, of patients believed to have ulcer are affected with a benign but insidious pulmonary tuberculosis.

The etiology of gastric and duodenal ulcer is a moot question. The streptococci found in the ulcer tissue bear probably the same relation to the ulcer as they do to tuberculosis. Hypervagotonia may be responsible. The cells of the mucosa may be weakened in their ability to obtain antipeptic and antitryptic substances from the blood. The post-operative administration of atropine is therefore recommended. Another factor in the etiology may be a disturbance of the endocrine system.

Autogenous vaccines are of value in persistent ulcer after operation as the micro-organisms retard cicatrization and extend cellular necrosis. Long-continued rest is advisable. After careful treatment by the internist for twenty weeks, the patient is either well or in proper condition for operation.



Gastro enterostomy will not cure all cases as there is great variety in the pathology. Marginal ulcers are often caused by non-absorbable suture material.

The physiological relations of the parts should not be altered and the type of operation should be based on the requirements of the individual case. The most rational operation is in general the removal of the lesion with the least possible risk.

Pain is the most frequent postoperative complaint and is often due to concomitant pathology in the appendix, gall-bladder, or elsewhere.

Adhesions not disturbing motility are important only when they mask pain. Small perforations of ulcers, especially duodenal ulcers, are comparatively common and lead to the formation of abscesses which may cause symptoms in the same way as chronically infected tonsils. Any abscess in the abdomen, however small, should be drained. Chronic peritonitis may be due to tuberculosis which, if active, should be demonstrated by the tests. In selected cases of tuberculous peritonitis brilliant results are obtained by the use of tuberculin.

Chronic lymphangitis around the coeliac plexus causes pain and can be cured by rest in the recumbent position and proper diet.

Marginal ulceration at the suture line of the gastro-enterostomy is not an infrequent cause of pain. Most of these ulcers close, but if they persist they must be treated operatively. Fistulae must be excised throughout their entire extent.

Epigastric pain following operation and occurring during defaecation is due to adhesions to the transverse colon and requires operation.

Gastric hyperæsthesia complicating atony should be carefully diagnosed and treated non-surgically.

Patients presenting Ortner's syndrome with increased blood pressure, etc. will be relieved by doses of hyocyanin, proper diet, and regulation of the bowels.

Persistent diarrhoea is generally neurogenous or infective in origin. The etiology and the treatment will be indicated by careful study.

Vomiting resulting from vicious circle requires operation to widen the stoma, relieve the kink, increase the mesenteric opening, or remove adhesions.

Bleeding ulcers may result from endocrine disturbances. If they are not benefited by endocrine treatment and rest they are probably due to cancer.

M. H. HOBART.

**Bohmansson, G.: A Contribution to Our Knowledge of Primary Sarcoma of the Ventricle.** *Acta chirurg. Scand.*, 1920, lii, 334.

The author reviews the literature and statistics in different countries as to the frequency of carcinoma and sarcoma of the stomach. In the ventricle sarcoma is much rarer than carcinoma.

Fenwick's opinion that sarcomata constitute between 5 and 8 per cent of the total number of ventricle tumors derives its chief support from the fact that the greater number of tumors of the ven-

tricle are not subjected to microscopic examination and the fact that in most cases it is impossible to decide to which class of growth the tumor belongs from the clinical symptoms or the macroscopic appearance.

Sarcoma of the ventricle occurs most frequently after the fortieth year of age, reaching its maximum incidence during the fifth and sixth decades. Lymphosarcoma occurs usually before the fortieth year of age.

The most ordinary form is the round-cell sarcoma. As a rule it appears as a firm, diffusely infiltrating tumor in the canalis ventriculi, the wall of which is thereby transformed into a homogeneous mass of considerable thickness. The mucous membrane may be uneven or nodular. Later it atrophies and becomes ulcerated. The infiltration is not circumscribed but continues along submucous or subserous paths toward the body of the stomach.

Metastasis takes the same course as in carcinoma and is observed earliest and most frequently in spherical-cell sarcoma. The regional lymphatic glands are infected at an early period and are often the seat of secondary tumors. Metastases appear in the kidneys, liver, omentum, pancreas, ovaries, skin, lungs, intestines, œsophagus, mediastinum, and dura mater. In regard to the symptoms, it has been stated by the greater number of writers that they are distinguished in no way from those of cancer. Especially in the infiltrating form of sarcoma the differential diagnosis from cancer is very difficult, if not impossible, before autopsy.

Surgical treatment is the only treatment that can be taken into account and resection in healthy tissue is the only form of operation that can be considered. The palliative measures—gastro-enterostomy or gastrostomy—are indicated only in exceptional cases as usually the orifices are not stenosed and there are no mechanical obstacles to the emptying of the cavity. The resection must be extensive, a total or subtotal gastrectomy, as microscopic strands of sarcoma tissue extend beyond the palpable mass.

Of 42 patients upon whom resections were done 9 died immediately after the operation. Fifteen have not reported any recurrence, and of the remaining 18, 6 died within a year of the operation. Twelve of the entire number radically operated upon lived more than one year afterward and 4 have been free from relapse for two years. All of those treated palliatively have died.

Ventricle sarcoma appears to have a more rapid course than carcinoma. The average period has been calculated at one and one-half years, while the average period for cancer is between two and three years.

H. A. MCKNIGHT.

**Deaver, J. B., and Ravdin, I. S.: Carcinoma of the Duodenum.** *Am. J. M. Sc.*, 1920, clix, 469.

The case reported is that of a male, 63 years old, who had had pain for five months and gas distention after meals for one year. The total acidity of the



gastric contents was 94, and the free HCl, 64. Operation revealed a carcinoma of the second portion of the duodenum which involved also the head of the pancreas. A section was removed for examination and a posterior gastro-enterostomy performed. The patient died on the third day from cardiac dilation.

A postmortem examination was done through the operative incision. From the findings it seemed probable that the carcinoma had its origin in the duodenum although the history was similar to that of ulcer.

The frequency and pathology of carcinoma of the duodenum is discussed on the basis of statistics from various clinics.

The article is summarized as follows:

1. Carcinoma of the duodenum is a rare condition. It is found in only 0.033 per cent of hospital autopsies.

2. The percentage of carcinomata of the entire intestinal tract originating in the small intestine varies from 2.5 to 3.1 per cent.

3. The incidence of carcinoma of the duodenum to that of carcinoma of the jejunum and ileum is as 47.7 per cent is to 52.2 per cent.

4. Inch for inch the duodenum is much more apt to undergo carcinomatous change than the jejunum or ileum.

5. The relative frequency of carcinoma in the various portions of the duodenum is as follows: first portion, 22.15 per cent; second portion, 65.82 per cent; third portion, 12.02 per cent.

6. Carcinomatous degeneration is not nearly as frequent in chronic duodenal ulcers as in chronic gastric ulcers.

C. R. STEINKE.

**Cade, A., and Devic, A.: Cancer of the Duodeno-jejunal Angle** (Cancer de l'angle duodéno-jejunal). *Arch. de. mal. de l'appar. digest.*, 1920, x, 419.

The authors' case was that of a woman 72 years of age. The patient died following a gastro-enterostomy. In discussing the condition emphasis is placed upon the importance in the diagnosis of pseudopyloric symptoms (dilatation of the stomach and hyperperistalsis) and hunger pains which develop several months before the symptoms of stenosis. The gravity of the affection is quite out of proportion to the degree of malnutrition and the growth of the neoplasm.

Stenoses below the ampulla of Vater give rise to two types of symptoms: the one, gastric (duodenal reflux, vomiting, and dilatation), and the other, intestinal (constipation and the signs of occlusion). In most cases the first type of symptoms predominates. Although it would seem that the site of the stenosis would influence the degree of the dilatation of the stomach this is not always true. In the case reported the cancer was situated for the most part in the jejunum but the peristaltic contractions were normal. The authors believe that the diagnosis of stenosis below the ampulla of Vater is confirmed by persistent bilious vomiting associated with a pyloric

syndrome. Hunger pain, which was a very definite symptom in the authors' case has never been recorded in a case of cancer of the duodenum although it is a classical symptom of duodenal ulcer.

W. A. BRENNAN.

**Heuyer, G., and Leveuf, J.: The Syndrome of Appendicitis and Pseudo-Appendicitis Associated with Dysentery** (Appendicitis et syndrome pseudo-appendiculaire des dysenteries). *Arch. d. mal. de l'appar. digest.*, 1920, x, 385.

In the acute amœbic dysenteries the ulcerous lesions of the large intestine are associated with a true and sometimes ulcerative appendicitis. This condition is rarely revealed because its symptoms are masked by the dysenteric toxæmia or by diffuse septic peritonitis.

In the course of chronic recurring dysenteries, both amœbic and bacillary, there is a pseudo-appendicitis syndrome which at first dominates the clinical picture but generally precedes a renewed attack of the dysentery. Such a syndrome appears to be due to the dysenteric ulceration rather than a true appendicitis.

If in the course of an acute dysentery the clinical symptoms point clearly to involvement of the appendix, the case is generally beyond aid by medical treatment and immediate operation is indicated. The authors' experience in a number of cases leads them to agree with De Barres who recommends appendectomy and an extensive cœcostomy in cases of even slight appendicitis with acute dysentery.

The pseudo-appendicitis syndrome should be treated medically until such treatment proves inefficacious, when operation is necessary. In all the authors' cases presenting this syndrome the condition has been cured or greatly improved by medical treatment alone. Surgery is very rarely necessary.

W. A. BRENNAN.

**Kummer, E.: Acute Appendicitis at the Beginning of the Crisis** (L'appendicite aiguë au début de la crise). *Rev. méd. de la Suisse Rom.*, 1920, xl, 133.

In 30 per cent of the cases of acute appendicitis the mucosa of the appendix is destroyed during the first day, and in 70 per cent. after the second day of the crisis. Because of the loss of this protective barrier the wall of the appendix is invaded by the putrefactive bacteria and may become gangrenous. Gangrene developed on the second day in 46 per cent of the cases, on the third day in 53 per cent, and on the fourth day in 65 per cent. A purulent peritoneal exudate was found in 18 per cent on the second day and in more than 40 per cent on the third and fourth days.

A leucocytosis of 20,000 tends to confirm the diagnosis of acute appendicitis. The course of the condition is generally determined during the first two days and it is only during this short interval that expectant treatment may be employed as a means of arriving at a diagnosis. After this period, temporizing may be fatal.



In 109 cases operated upon during either the first or second day of the crisis the mortality was 1.9 per cent. Among those in which operation was done the third day it was 14 per cent and among those operated upon between the fourth and the twelfth days it was 22.4 per cent. All but one of the fatalities were due to peritonitis. Peritonitis, the chief complication of acute appendicitis, begins with the crisis. Up to the thirty-sixth hour it is usually not dangerous but after this period it is nearly always suppurative and if it becomes generalized is fatal.

The mortality among medically treated cases of acute appendicitis has been about 10 per cent for the past twenty-five years but the operative mortality is steadily falling. In 522 cases of old or recent suppurative appendicitis the mortality was 5 per cent and among those operated upon within the first forty-eight hours it was less than 2 per cent.

W. A. BRENNAN.

**Muehsam, R.: The Present Status of Early Operation for Appendicitis** (Der heutige Stand der Frühoperation der Appendicitis). *Ztschr. f. aeztl. Fortbild.*, 1920, xvii, 1.

Operation is not indicated in every first attack of appendicitis as frequently this attack is also the last. The decision must be made from the condition of the pulse, the general appearance, abdominal rigidity, pain, and meteorism. If one of these signs indicates that the condition is serious, early operation should be undertaken. In recurrent attacks operation should be performed immediately. The author attaches no significance to the leucocyte count or the leucocyte curve.

Muehsam prefers the right flank incision. When the exudate is clear or only slightly turbid the abdomen may be closed without drainage, but when it is decidedly turbid or purulent, drainage or tamponade should be instituted and combined with Fowler's position. Neither irrigation nor walling off of the bowels is advisable. To obtain peristalsis early, salt solution should be given by rectum and physostigmin, pituglandol, or homonol given hypodermically.

Of 182 patients with acute attacks who were operated upon during the first, second, or third day only 4 (2.2 per cent) died.

ADLER (Z).

**Richardson, E. P.: Ileostomy for Postoperative Obstruction following Appendectomy.** *Boston M. & S. J.*, 1920, clxxxii, 362.

In considering the place of enterostomy in the treatment of intestinal obstruction, a distinction should be made between obstruction occurring spontaneously or late after operation and that occurring early after operation during the period of convalescence. The latter is due usually to recent plastic or partly organized adhesions which are temporary rather than permanent causes of obstruction.

Seven cases of obstruction occurring during convalescence from appendicitis are reported. In

5 of these ileostomy was done for obstruction which was apparently mechanical in nature. Four of the five patients were children. Recovery occurred in every instance with spontaneous closure of the fistula, the patients remaining well for from one to eight years. The results suggest that ileostomy is a more favorable method of treating obstruction due to recent adhesions than other types of obstruction. Good results depend on early operation, and it is far better to operate on an occasional case unnecessarily than to postpone operation until the later stages of obstruction have developed.

**Sloan, H. G.: Gas Cysts of the Intestine; Report of a Case.** *Surg., Gynec. & Obst.*, 1920, xxx, 389.

The author reports a case in which the small intestine was covered to a large extent with small cysts. A complete autopsy report is given.

The patient, a man aged 32, had suffered for fifteen years with stomach trouble. For the past two months he had retained nothing, but had never vomited blood nor passed any blood by rectum. An X-ray plate did not reveal any liver shadow under the diaphragm but the outline suggested a small gut.

Sudden abdominal pain and signs of perforation hastened operation. When the abdomen was opened clusters of gas-containing cysts attached to the lower portion of the small bowel opposite the mesentery and a prepyloric perforated ulcer completely obstructing the pylorus were found. The ulcer was closed and a gastro-enterostomy done. The patient died the following day.

In the author's opinion the etiology of the condition is mechanical.

P. M. CHASE.

**Lockhart-Mummery, P.: The Operative Treatment of Ulcerative Colitis.** *Brit. M. J.*, 1920, i, 497.

In spite of extensive clinical and bacteriological investigation, very little advance has been made during the past ten years in the diagnosis and treatment of truly chronic ulcerative colitis. The author considers two types of cases: (1) the ordinary sporadic chronic type, and (2) the chronic type following the epidemic forms of amœbic or bacillary dysentery.

The clinical histories are variable. Usually there is a history of continuous diarrhœa followed by the constant appearance of blood in the stools. The sigmoidoscope, by means of which the characteristic ulcerative condition of the bowel may be seen, should be used to confirm the diagnosis.

The author believes that medical treatment has not been successful except in very mild cases but he admits that possibly this opinion is incorrect for, being a surgeon, he probably sees only the medical failures. The author's treatment consists in immediate appendicostomy followed in severe cases by early and frequent saline irrigations. After the diarrhœa has been checked and there is a consequent general improvement in the patient's condition the use of from 3 to 6 pints of a saline wash two or three



times a day is advisable. On no account should an antiseptic be used for irrigation as poisoning is almost sure to follow. Solutions of silver nitrate or protargol may be employed, but the best results are obtained with normal saline solution.

KINGSLEY RENSCHAW.

**Pauchet, V.: The Treatment of Chronic Intestinal Stasis by Total Colectomy** (Traitement de la stase intestinale chronique; colectomie totale). *Paris méd.*, 1920, x, 280.

Pauchet has had ten years' experience in the treatment of chronic intestinal stasis by short circuiting the colon. The majority of operations were entirely successful.

Medical treatment is first given a trial as Pauchet believes that for several years chronic intestinal stasis due to changes in the intestinal walls, the formation of adhesions, etc. is purely functional and due to glandular insufficiency. The earlier colectomy is done, however, and the younger the patient the better are the results. Minor operations do not generally give permanently satisfactory results.

For a long time Pauchet did a hemicolectomy but now he prefers a total or almost total colectomy. A right hemicolectomy leaves a splenic kink and frequently a sigmoid kink. The removal of the left half of the transverse colon and the splenic colon makes the end-to-end anastomosis easier. The small intestine distends and becomes transformed into a kind of large intestine.

Pauchet's technique consists of the following stages: (1) a long incision to the left of the median line; (2) exploration of the intestine, stomach, etc.; (3) liberation of the large intestine; (4) ligature of the mesocolon; (5) intestinal resection; (6) end-to-end anastomosis of the ileum to the sigmoid; (7) repair of the mesocolon.

After the suturing is completed it is well to introduce an œsophageal drainage tube through the anus as far as the anastomosis. The tube should be sutured to the anus and kept in place for a week.

W. A. BRENNAN.

**Fasano, M.: A Contribution to the Surgery of the Descending Colon** (Contributo alla chirurgia del colon discendente). *Polìclin.*, Roma, 1920, xxvii, sez. chir., 61.

In a case of persistent stercoral fistula which had resisted plastic operations the author determined to operate radically and did a left pararectal laparotomy externally to the fistulous tract. A cicatricial mass composed of omentum and intestinal loops adherent to each other and to the abdominal wall in the vicinity of the fistula was discovered. When these adhesions were freed the descending colon was also found to be adherent to the abdominal walls near the fistula.

After the descending colon had been freed externally and posteriorly and complete hæmostasis had been secured, the colon was sectioned at the level of the splenic flexure and the entrance into the sig-

moid and removed with the part of the abdominal wall which contained the fistulous tract. It was then possible to approximate the two ends without any trouble. The stumps were united by end-to-end anastomosis. The abdominal wall was sutured in layers and a small capillary drain was inserted. The postoperative course was normal.

In this case the anatomical fixity of the descending colon, which was increased by the mass of adhesions, almost constituted a contra-indication to the procedure adopted. Moreover the author had no technical guide for the anastomosis in a partial colectomy of this kind. It was his plan at first to follow W. J. Mayo's scheme of introducing a sigmoid tube through the anus but this was not necessary. The mobilization of the colon, which it was believed would be impossible, was effected quite easily.

The only difficulties in an operation of this type are encountered in the splenocolic ligament corresponding to the splenic angle and the descending mesocolon which contains important vessels. The relation of the operation to the ureters is important but the difficulty in this respect is not a contra-indication to the procedure.

With regard to this type of anastomosis the author discusses the objections raised to the end-to-end type and the general preference for lateral anastomoses. Fasano has adopted the end-to-end anastomosis, basing his choice on the results of certain experiments. He found that after lateral anastomosis a column of water introduced into the intestine from above had difficulty in traversing the canal, the proximal portion of the anastomosed bowel being much distended in comparison with the distal portion. No such difficulty was noted after an end-to-end anastomosis. This fact has been verified repeatedly, and Fasano therefore believes that lateral anastomoses hinder the normal peristaltic movements and favor intestinal paralysis. The difficulty of uniting the two intestinal stumps of different diameters may be obviated by making a small incision in the smaller stump and flattening out the angle thus formed.

W. A. BRENNAN.

**Bevan, A. D.: Carcinoma of the Splenic Flexure.** *Surg. Clin. Chicago*, 1920, iv, 311.

A patient, 50 years of age, complained of loss of weight and strength, diarrhoea, and blood in the stools. The blood was found in the center of the stool. Stomach and duodenal as well as lower bowel pathology were excluded by tests and X-ray, fluoroscopic, and sigmoidoscopic examinations. No palpable mass was felt, but the clinical findings pointed toward abdominal pathology.

At operation a carcinoma of the splenic flexure was found. The mass was about the size of a fist and adherent to all of the surrounding structures.

A Mikulicz operation was then done. The tumor mass was freed from the surrounding structures by cutting the mesocolon, breaking the adhesions, and thus mobilizing the region of the splenic flexure.



Dry gauze was packed into the old tumor bed to prevent oozing of blood, and the tumor delivered outside of the abdomen. Iodoform gauze was then substituted for the dry pack and the upper wound was closed, the tumor mass being left outside. A No. 14 American catheter for drainage was tightly fastened into the proximal (transverse) colon with purse-string sutures.

Three or four days later the bowel on both sides of the tumor was ligated and the mass removed with the electric cautery. This left a double colostomy opening.

After a week or ten days a heavy clamp was placed on the septum between the adjoining bowel ends and left there to bring about pressure necrosis. The faecal matter then passed from the proximal to the distal gut and the external wound gradually closed. If the wound does not close spontaneously it may be closed after a few weeks under local anaesthesia.

The Mikulicz is not always the operation of choice, but should be used if conditions arise similar to those in the case described. The prognosis is very grave, the mortality being 50 per cent. If the patient survives, however, the operation will result in an alleviation of symptoms, although a radical cure is not to be expected. M. H. HOBART.

#### LIVER, GALL-BLADDER, PANCREAS, AND SPLEEN

**Mosti, R.: A New Contribution to Hepatopexy** (Nuovo contributo alla epatopessia). *Riforma med.*, 1920, XXXV, 1090.

Mosti refers to a method of performing hepatopexy, neglected by the majority of surgeons, which was introduced by the Italian surgeon Santucci in 1901. He reviews all the methods in use for fixing the ptosed liver and insists that the Santucci method is the best. An operation performed successfully by this method on a woman 41 years of age is described. In the Santucci method the liver is placed on a cord formed by the parietal peritoneum and sustained by the right costal arch by means of stitches through the hepatic margin. The abdominal portion, denuded for a space of its peritoneal covering, will acquire large and solid adhesions.

The incision begins at the costal border, follows the external margin of the right rectus, descends obliquely toward the right to about four finger-breadths below the costal arch, and then gradually ascends toward the posterior axillary line. It involves the entire thickness of the abdominal wall except the peritoneum. The musculocutaneous strip thus formed is turned back on the thorax. The peritoneal serosa is then incised and a strip obtained which is twisted so as to form a cord. The method is a marginal hepatopexy in which a serous peritoneal cord is substituted for the horizontal cords proposed by Jeannel and to which a complementary extraperitoneal fixation of the free border of the liver is added. W. A. BRENNAN.

**Fravel, R. C.: The Occurrence of Hypochlorhydria in Gall-Bladder Disease.** *Am. J. M. Sc.*, 1920, clx, 512.

The author reports the gastric findings in 61 cases of bile-tract infection, with and without stones, which were proved at operation. Contrary to the formerly accepted idea that hyperacidity is the rule, a low percentage of hydrochloric acid was found in the majority of cases. In none was there associated pathology of the stomach or malignancy. The Ewald test meal was used, and apparently but one analysis was made in each case. The superiority of fractional analyses is conceded.

Of the 61 cases, 16 showed an absence of free HCl; 45, a free HCl content of less than 20; 11, a normal content; and only 5, an increase. Eleven cases showed a total acidity of 50 or more and 39 a total acidity of less than 40. W. H. NADLER.

**Rolleston, H.: Dyspeptic and Other Referred Symptoms Associated with Disease of the Gall-Bladder and of the Appendix.** *Brit. M. J.*, 1920, i, 317.

In this article the author considers referred symptoms associated with diseases of the gall-bladder and appendix which are localized in the epigastrium, do not at once suggest local disease of the responsible organ, and are remote in place. He is interested primarily in the gall-bladder and appendix which are manifesting the results of a former inflammation rather than those of a progressive and chronic inflammatory process.

The referred symptoms may be divided according to the mechanism of their production into reflex, mechanical, toxic, and infective. Pylorospasm, failure of the ileocaecal valve to relax, caecal stasis, inhibition of defaecation, frequency or inhibition of micturition, and cardiac irregularities are classified under mechanical symptoms. MacKenzie and Hurst state that reflex epigastric pain is due to an irritative focus in the spinal cord. The mechanical factors include pericholecystic adhesions which embarrass the movements of the stomach, interfere with the passage of food through the pylorus, or cause the formation of an hour-glass stomach. Adhesions around the appendix may lead to intestinal stasis with ensuing toxæmia and may alter the radiation of pain. They have been thought also to cause pain on the left side and, if the gall-bladder is the seat of inflammation, pain in the right iliac fossa.

The toxic factor which produces pain in the viscera is the absorption of bacterial toxins from the gall-bladder or appendix. Such absorption causes myocarditis and possibly hæmorrhages from the stomach and intestines. The appendix or gall-bladder acts as a focus of infection. The appendix is probably the primary focus, and the gall-bladder, kidney, pancreas, and local phlebitis in the iliac veins are secondary foci.

The dyspepsias caused by disease of the gall-bladder and appendix have been recognized only



recently. The author emphasizes the importance of preventing infections in the gall-bladder and appendix by eliminating foci of infection in the tonsils and teeth. Supervision of the food supplies is desirable and early attention to signs of intestinal infection and constipation.

The symptoms of the dyspepsias described are variable, and a diagnosis as to which organ is primarily affected cannot be made from the character of the subjective manifestations alone. Epigastric pain and tenderness with flatulence are the most constant features, but the time of onset, relief from food, and the presence of heartburn and vomiting are variable. Neurasthenia and recurrent headache may be prominent symptoms, especially in cases of long-standing appendicitis with pain and toxæmia. The acid content of the gastric juice varies, but the author is inclined to agree with Fenwick that hyperchlorhydria is very apt to be associated with active irritation, whereas in the presence of mere thickening, adhesions, and kinks the gastric juice may have a low content of free hydrochloric acid or none at all. Rolleston cites the figures of Eusterman of the Mayo Clinic who, in a series of cases of gastric and duodenal ulcer found that 40 per cent of the patients had disease of the appendix and 9.7 per cent, disease of the gall-bladder.

As aids in the diagnosis the use of the X-ray and the special diagnostic methods of Hurst, Friedman, and Bastedo are advised. Complications associated with diseases of the gall-bladder and appendix are chronic colitis with exhausting diarrhœa, pancreatitis with diarrhœa or diabetes, myocardial changes with anginoid symptoms cured by a cholecystectomy, pyelitis, pyelonephritis, and, less commonly, synovitis and arthritis. F. S. SCHOONOVER, JR.

**Krabbel, M.: The Pathology and Treatment of Cholelithiasis** (Zur Pathologie und Therapy der Cholelithiasis). *Ztschr. f. aenzl. Fortbild.*, 1920, xvii, 5.

The author describes three cases of torsion of the pedicle and volvulus of the gall-bladder. The patients were women in the eighth decade of life who suddenly exhibited all the symptoms of acute ileus.

Clinically the only sign present was a painful resistant area beneath the left lobe of the liver which in one case simulated the form of a transversely placed kidney and showed indefinite fluctuation.

The first patient was operated upon following a diagnosis of "obturating carcinoma of the hepatic flexure." At operation a chronically inflamed gall-bladder was found which was rotated 180 degrees on the cystic duct. As factors predisposing to this volvulus the author considers a bulging of the wall of the gall-bladder due to gall-stones and weakness and stretching of the ligaments due to lack of fat. The exciting cause was severe exertion.

Cases of torsion of the pedicle of the gall-bladder without stones have not been reported.

KONJETZNY (Z).

**Horgan, E. J.: The Histogenesis of Carcinoma in the Islets of the Pancreas.** *J. Lab. & Clin. Med.*, 1920, v, 429.

A detailed study of 262 pancreases was made at the Mayo Clinic in an endeavor to throw light on the histogenesis of pancreatic cancer. The association of cancer with chronic inflammatory changes in other organs led the author to expect neoplastic changes in chronic pancreatitis. The specimens were removed at autopsy from patients who had died of diseases of the stomach, duodenum, or gall-bladder.

The various pathologic conditions noted included acute and chronic pancreatitis, fat necrosis, hyperplasia in the islets of Langerhans, cysts, and hypertrophy. Hypertrophy and hyperplasia in the islets in cases of chronic pancreatitis were selected as the subjects of the investigation reported.

Some investigators consider hypertrophy and adenomata of the islets as indicative of a precancerous state. Hypertrophy, however, has been found in association with diabetes although it is not characteristic of this disease. In none of the author's cases in which hypertrophy of the islets was found was the condition associated with glycosuria.

Chronic pancreatitis was an almost constant finding in cases of gastric and duodenal ulcer. The extent of the inflammation manifested by a lymphocytic infiltration or a fibrosis was dependent upon the location and duration of the ulcer and the severity of the acute exacerbation.

Hypertrophy of the islets in connection with a chronic pancreatitis was observed in 48 of the 262 cases. The histories of these 48 cases showed that gastric or duodenal ulcer was found at operation or autopsy in 79.3 per cent. Gastric ulcer was found in 71 per cent of the 262 cases. The islets showed hypertrophy in 25 per cent. Gastric and duodenal ulcers were found associated in 11 cases and the islets showed hypertrophy in 2 of these (18.1 per cent).

Hypertrophy was noted also in association with several other conditions.

The hypertrophied islets, which were generally found in large numbers, varied from 5 to 6 mm. in diameter, were surrounded by a thickened connective-tissue capsule, and contained hypertrophic and hyperplastic epithelial cells in various stages of differentiation. Some showed hyperplastic undifferentiated cells migrating through the capsule, a condition which is undoubtedly carcinoma.

The author believes that neoplastic potentialities are not confined to any single type of cell, and that cancer of the pancreas may arise from any one of the epithelial units, i.e., the ducts, the acini, or the islets.

The work reported demonstrated the successive biopathologic changes in the epithelial cells of the islets in the pancreas from the normal to early carcinoma and will place on record in the literature 2 of the earliest cases of carcinoma of the pancreas.

A. J. SCHOLL, JR.

**Garrod, A. E.: The Schorstein Lecture on the Diagnosis of Disease of the Pancreas.** *Brit. M. J.*, 1920, i, 459.

The author emphasizes the fact that the diagnosis of pancreatic lesions is uncertain. In this connection he quotes Wardell who, in 1871, wrote: "No symptoms are pathognomonic of pancreatic disease; an assemblage of symptoms indicates the probability of its lesion."

The factors which aid in the diagnosis of pancreatic lesions may be divided into three groups: (1) clinical signs and symptoms, i. e., tumor, pain, tenderness, vomiting, cyanosis, and the signs of pressure upon neighboring structures; (2) failure of the external secretion of the pancreas; and (3) failure of the internal secretion of the pancreas.

A mass, which is usually movable, may or may not be present in the upper abdomen in pancreatic disease. The pain is often very severe and may be continuous or paroxysmal. Vomiting and severe constipation are also prominent symptoms. Jaundice, the one pressure symptom which is worthy of note, often aids materially in the diagnosis.

In drawing attention to the supposed relation between the thyroid gland and the pancreas, the author discusses Loewis' test. Two or three drops of 1:1000 solution of adrenalin are dropped into the conjunctival sac. If dilatation occurs in from one-half to one hour, disease of the pancreas is probable.

The author discusses in detail also the various other tests for the failure of the external secretion of the pancreas and concludes that steatorrhœa and creatorrhœa are the most important.

Failure of the internal secretion of the pancreas may be shown by the presence of glycosuria. The author questions the value of the Cammidge reaction.

J. A. H. MAGOUN, Jr.

**McConnell, A. A.: Splenomegaly and Jaundice; Splenectomy.** *Practitioner*, 1920, civ, 278.

The article presents the diagnostic features and treatment of diseases in which splenomegaly is associated with jaundice.

The outstanding features of one case which is reported in full were: chronic jaundice, afebrile exacerbations, splenic enlargement, leucopœnia, absence of liver enlargement, and intermittent presence of bile in the urine. The differential diagnosis lay between Hanot's hypertrophic biliary cirrhosis, Banti's disease, and hæmolytic jaundice.

The condition was regarded as Hanot's cirrhosis without enlargement of the liver. Banti's disease was excluded because of the presence of early and well-marked jaundice, the absence of ascites, and the absence of any definite hæmorrhages. Hæmolytic jaundice was excluded (in the absence of a fragility test) by the depth of the jaundice, the leucopœnia, and the general appearance.

A general theoretical discussion of the three diseases follows, the conclusion being reached that splenectomy is indicated if there is evidence of involvement of the liver secondary to the involvement

of the spleen or if the spleen is a factor in the causation of hepatic cirrhosis. The fact that the spleen is sometimes enlarged before the occurrence of hepatic enlargement and the development of jaundice is usually taken as evidence of a systemic infection, but may signify a primary involvement of the spleen.

The author sums up the reasons for splenectomy in cirrhosis of the liver as follows: (1) it relieves the liver of work; (2) it renders circulating toxins more dilute in the portal vein; (3) it is of great benefit in chronic conditions characterized by increased blood destruction; (4) in the Mayos' hands it has given "extraordinarily good results."

P. M. CHASE.

## MISCELLANEOUS

**Straus, D. C.: Subdiaphragmatic Abscess—Transpleural Drainage of a Case Due to Abscess of the Liver.** *Surg. Clin. Chicago*, 1920, iv, 377.

The case reported was a case of subdiaphragmatic abscess due to abscess of the liver in a man who went to Central America a year and a half ago and while there developed malaria and amœbic dysentery.

Bacillary dysentery is caused by four closely related species of bacteria: the bacilli of Shiga-Kruse, Flexner, and Strong, and the Hiss-Russell Y-bacillus. The dysentery caused by the Shiga-Kruse bacilli is most severe, being associated with frequent complications and a high mortality. The changes are superficial and tend to remain localized in the mucosa, particularly about the ileocœcal valve. Severe nervous and toxic symptoms, myelitis and neuritis, are common in this type and do not occur in amœbic dysentery. Liver abscesses are rare in bacillary dysentery and when they do occur are usually multiple and small. Amœbic dysentery usually produces a single large abscess.

Amœbic dysentery is caused by the entamœba histolytica dysenteriae of Schaudinn. In this condition deep ulcers are formed, particularly in the rectum and sigmoid flexure. The amœbæ enter the submucosa by way of the glands and the necrotic ulcers formed may reach even to the serosa. From these intestinal ulcers the amœbæ enter the veins of the intestine and are carried by way of the portal vein to the liver. Often by the time the case reaches the surgeon the pus is sterile. Among the bacteria that have been found in these abscesses are staphylococcus albus and aureus, bacillus coli, and pneumococci.

Abscess is the most common complication of amœbic dysentery and about 85 per cent of all tropical liver abscesses result from this condition. The abscess is usually located in the upper part of the right lobe of the liver, near the convexity and particularly near the posterior axillary line between the ninth and tenth ribs. This occurs in about 95 per cent of the cases.

Clinically, abscess of the liver is rarely observed as early as one to three weeks after the dysentery.



Usually it develops much later; in some cases after a lapse of years.

The syndrome as a rule consists of fever, enlargement of the liver, and liver pain, although any one of these symptoms may be absent. Frequently also a condition known as "liver abscess facies" is observed. The skin is pale and yellowish, the face is emaciated, the eyes are deeply sunken, and the sclera are waxy and subicteric.

While fever may be absent occasionally, it is seldom absent entirely. It is not characteristic in its type or course, but usually is not high and tends to rise in the evening. It may be intermittent like that of malaria, but a point in the differential diagnosis from malaria is the absence of enlargement of the spleen in cases of liver abscess. At the time of onset, the fever is not infrequently associated with chills. The occurrence of chills later suggests the formation of new abscesses.

Enlargement of the liver is always present in cases of solitary liver abscesses. In cases of small abscesses there is a diffuse inflammation and general enlargement of the liver. When the abscess lies near the concavity of the liver the epigastrium is bulged forward. When the abscess is very large, pressure on the portal vein may cause ascites. Often there is bulging of the lower intercostal spaces on the right side of the thorax.

Spontaneous liver pain and pressure pain are also of importance in the diagnosis. These pains vary greatly in intensity, are often localized, and in a general way indicate the situation of the abscess. When it is located in the upper portion of the right lobe, the pain often radiates to the right shoulder blade. When it lies well in the middle of the right lobe, pain often results from deep pressure in the intercostal spaces. A perihepatic friction-rub also aids in the localization.

Another symptom is interference with respiration due to reflex immobility of the diaphragm, inflammatory paralysis, mechanical compression of the lung, or a secondary pleural effusion.

A decided leucocytosis is almost always present, the count being ordinarily between 15,000 and 20,000.

In the treatment diagnostic puncture should be done only when it can be followed immediately by operative drainage. Because of the danger of infection, hæmorrhage, and injury to a viscus or large vessel, it should not be done on the anterior surface or in the left lobe. If in an exploratory laparotomy the abscess is found in the usual location the puncture may be made in an area bounded anteriorly by the anterior axillary line, posteriorly by the posterior axillary line, and above by a line not over 2 in. above the costal margin. The subsequent operative opening should be made high up as the liver contracts during the course of healing.

In case the needle has penetrated the diaphragm before reaching the pus, as in subphrenic abscess or liver abscess, it will be raised by the diaphragm at each inspiration, whereas if the condition is empyema or lung abscess, this does not occur.

Regarding the prognosis of liver abscess not operated upon, the author states that small abscesses may heal spontaneously, but such healing is rare and should not be awaited.

The treatment should consist of open operation and perpleural or parapleural drainage or drainage effected by abdominal laparotomy or, rarely, by lumbar incision. The first two methods are probably the most generally used and the operation may be done under local anæsthesia. I. W. BACH.

**Barron, M.: Abnormalities Resulting from the Remains of the Omphalomesenteric Duct; Report of Two Cases.** *Surg., Gynec. & Obst.*, 1920, xxx, 350.

A case of umbilical polyp lined with intestinal mucosa and a similar specimen found at autopsy are reported with a résumé of the literature.

The patient, aged 5, had a persistent discharge from the umbilicus which began shortly after birth although nothing abnormal was noted at the time the cord was separated. On examination a small polypoid mass of granulation tissue was found. This mass had no opening and the discharge which covered it did not contain fæces or urine. The mass was excised and the wound healed promptly.

Microscopic examination showed an internal core of irregular bundles of smooth muscle fibers and connective tissue and a peripheral or glandular zone resembling the mucosa of the intestine.

The specimen obtained at autopsy showed a narrow Meckel's diverticulum with a thick, cord-like attachment to the abdominal wall near the umbilicus.

The article is summarized as follows:

1. Umbilical inclusions of remnants of the omphalomesenteric duct are not at all uncommon. Most of the "umbilical granulomata" are probably structures of this type.

2. Umbilical polypi presenting gastric mucosa undoubtedly originate in remnants of the omphalomesenteric duct rather than in gastric diverticula. The histological and functional characteristics of these anomalies are probably determined by the stage of foetal development during which the constriction occurs.

3. The milieu is an important factor in determining the type of cells called forth by any given stimulus.

P. M. CHASE.

**Tierney, J. L.: Pneumoperitoneum.** *J. Missouri State M. Ass.*, 1920, xvii, 137.

After giving a résumé of the literature the author describes the procedure he himself uses to induce pneumoperitoneum for the study of intra-abdominal conditions.

His conclusions regarding pneumoperitoneum are as follows:

1. The technique is exceedingly simple. The requirements are an adequate apparatus, a proper needle, surgical cleanliness, local anæsthesia, and care to prevent puncture of underlying viscera.

2. The method is harmless. This assumption is based on the fact that in some 400 recorded cases there have been no untoward results.

3. The procedure has remarkable diagnostic possibilities, especially for the fluoroscope, and is easily adapted to film and plate work.

4. The most important contra-indication is acute inflammation of the peritoneum. Others are

respiratory and circulatory disturbances, meteorism, and the presence of numerous adhesions.

5. The simplicity, diagnostic value, and harmlessness of the method, particularly if the oxygen is withdrawn afterward, render it practicable in ordinary routine diagnostic procedure, and because of its intrinsic worth it should have a wider application.

P. M. CHASE.

## SURGERY OF THE EXTREMITIES

### DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

**Colvin, A. R.: The Clinical Course and Pathology of an Obscure Osteitis Causing Loose Bodies in Joints.** *Minnesota Med.*, 1920, iii, 65.

The origin of loose bodies in joints has always been problematical. The four cases reported in this paper furnish some evidence that the bodies come from an osteitis which results in loosening of bone just under the cartilage covering of the articular surface. These loose pieces with a partial covering of cartilage finally become free in the joint cavity. It is believed that the pieces are not sequestra. The author is inclined to accept the theory that the osteitis is due to an infection and that the symptoms arise from a low-grade inflammation.

In the four cases reported, in all of which the condition involved the knee, the only symptom for the first few years was pain of an aching character referred to that joint. After several years the joint became swollen, impaired in function, and limited in motion, and presented a clinical picture resembling that of early arthritis deformans. Finally the characteristic symptoms of loose bodies, catching and locking, developed. In one case pain was the only symptom for four years, and in another, the only symptom, for fifteen years.

**CASE 1.** Man of 51. Dull aching pain and inability to extend the knee completely. No swelling or tenderness. The roentgenogram did not show the presence of a loose body but revealed a small circumscribed area on the mesial condylar surface of the femur. A year later symptoms of loose body developed and the X-ray showed a loose body in the suprapatellar region.

**CASE 2.** Girl of 17. First seen three years after the onset of pain which up to that time had been the only symptom. A small lesion much the same as that noted in Case 1 was seen in the roentgenogram. About a year later (four years after the onset of symptoms) severe pain and locking occurred and on operation an oval body still attached by strands of the posterior crucial ligament was found near the defect in the femoral condyle which was revealed by the X-ray.

**CASE 3.** Boy of 18. Six years of more or less constant pain was followed by swelling and painful movement. The roentgenogram showed an area

on one femoral condyle which appeared partly detached from the rest of the joint surface. At operation this area was found to be a partly detached piece of bone covered on one side by the joint cartilage and on the other by an irregular layer of fibrocartilage.

**CASE 4.** Man of 28. Symptoms for fifteen years. Catching pain lasting a moment or two. Occasionally there was absence of symptoms for two or three months at a time. The findings in the roentgenogram were practically the same as in Case 2.

These four cases represent a condition described by Koenig in 1888 as osteochondritis dissecans. It is generally believed that the condition is of traumatic origin, but the findings in the author's cases do not bear out this theory. It is clear that the separated body is not deprived of its nutrition for cartilage grows on its detached surface and capillaries are present before complete detachment. Colvin therefore concludes that infection and inflammation are the etiological factors.

W. A. CLARK.

**Marsiglia, G.: On the Etiology and Pathogenesis of Multiple Cartilaginous Exostoses** (Sull'etiologia e patogenesi della esostosi cartilaginea multipla) *Riforma med.*, 1920, xxxv, 177.

Multiple exostoses ought not to be considered simply as a product of local changes in the interdiaphyso-epiphyseal cartilage but as a symptom of a general morbid condition which is a distinct and true disease and is often associated with other anomalies as regards the form and length of the bones.

In the author's opinion there is some relation between rachitism and the development of multiple exostoses and both are due to alterations in the thyroid or other endocrine glands. He is more inclined to attribute the condition to pluriglandular changes. In a case of his own multiple exostoses were associated with rachitism, but there was no appreciable variation in the development of the thyroid.

W. A. BRENNAN.

**McCurdy, S. L.: Focal Putrefactions and Their Bearing on Osteo-Arthritis and Other Diseases.** *J. Orthop. Surg.*, 1920, ii, 92.

The orthopedic surgeon may not hope to arrest the onward advance of an osteo-arthritis until he



has found the source of the toxin. When necessary, the pathologist, the internist, the genito-urinary specialist, the gastro-enterologist, the radiographer, the laryngologist, and the dentist should be called into council.

Increased knowledge of internal medicine and investigations which have thrown new light on systemic diseases with local and remote manifestations have led the clinician to assist as far as possible in working out a better understanding of these conditions.

Heretofore it has been the custom to treat symptoms occurring in definite parts of the body by local methods. In more recent years it has been discovered that these local symptoms are often only remote manifestations of a blood-stream infection having its source in some area of putrefaction. Chief among such areas are: (1) the throat, (2) the mouth, (3) the alimentary canal, and (4) the genito-urinary tract.

The principal conditions of the throat which give rise to blood-stream infection are hypertrophy and ulceration of the tonsils and adenoids. All the diseases of the middle ear and mastoid, meningitis, intracranial abscess, sinusitis, etc. are traceable directly to the throat. Tuberculous glands of the neck are now removed only after the tonsils have been operated upon as a possible source of infection. Mouth breathing, a consequence of throat or nasal obstruction due to enlarged tonsils and adenoids, results in anæmia, chlorosis, endocarditis, endarteritis, tuberculosis, and general systemic toxæmias.

The principal disease of the mouth, the most frequent source of systemic infection, is pyorrhœa. This may result in sore and painful joints, arthritis deformans, endocarditis, intestinal indigestion, loss of teeth, antral disease, alveolar abscess, osteomyelitis, neuritis, neuralgia, glandular enlargement, endarteritis obliterans, and painful feet.

The alimentary canal may be a source of systemic infection because of constipation or intestinal stasis which results in the accumulation of fæces and putrefactive changes. Intestinal ulcers, appendicitis, affections of the gall-bladder, the liver, the mesentery, and the portal circulation, and systemic conditions, such as headache, anæmia, etc., are all traceable to this condition.

In the genito-urinary tract occur a great number of serious and fatal secondary infections. The primary cause is gonorrhœa followed by urethritis. Secondary conditions which are apt to develop are stricture of the urethra resulting first in perineal fistula and finally in complete occlusion, retention of urine, and uræmia. Chronic urethritis sometimes leads to chronic prostatitis which may have grave complications such as deep perineal abscess. Systemic infections from chronic genito-urinary diseases are acute and chronic gonorrhœal arthritis. In the majority of cases this leads to ankylosis and permanent deformity of the extremities.

G. E. BEILBY.

**Roberts, P. W.: Syphilitic and Tuberculous Joints.**  
*Am. J. Syphilis*, 1920, iv, 309.

Roberts draws his conclusions from more than two hundred bone and joint cases. His contentions, supported by those of others, are that the symptoms of syphilitic and tuberculous joints are so similar that it is often difficult to differentiate the two conditions definitely. "The X-ray may show a bone lesion in either disease, but, contrary to accepted theories, there are usually no definite characteristics upon which to base a diagnosis." The author's study demonstrated also that in the late manifestations of inherited lues the Wassermann test is extremely unreliable.

In the cases reviewed the results of treatment were not often prompt. The author believes that this fact was due to the slower or oral method of drug therapy which was employed. Frequently when the medication was omitted too soon after the disappearance of the symptoms a relapse occurred but when the administration of the drugs was resumed the response was quick.

Roberts emphasizes particularly the importance of adapting the treatment to the requirements of the individual case. Local treatment is also of importance. In tuberculosis the plaster cast should be used; in syphilis, the ordinary splint.

It is unwise to make a diagnosis of joint tuberculosis until the possible presence of inherited syphilis has been eliminated by five or six weeks of vigorous antiluetic treatment.

The article gives 15 case reports.

A. R. HOLLENDER.

**Thevénot: Complications of Torsion of the Knee**  
(Les complications de l'entorse du genou). *Rev. de chir.*, Par., 1919, vii, 942.

Complications which may follow torsion of the knee may involve the ligaments, the synovia, or the meniscus, according to the structures injured. Usually the knee is twisted inward and there is dragging on the upper insertion of the internal lateral ligament.

When chronic arthritis, proliferating synovitis with or without the presence of foreign bodies, meniscitis, and luxation of the meniscus are complications of torsion of the knee they are almost always due to an inward twist. It is the internal meniscus which is generally involved by meniscitis or luxation as the inward twist of the knee occurs most frequently and the internal lateral ligament constitutes the principal fixation of this meniscus.

The majority of the complications may be cured by orthopedic treatment.

W. A. BRENNAN.

**Hutchins, C. P.: Weakened Foot: Its Measurement and Correction.** *Med. Rec.*, 1920, xcvi, 681.

Weakened foot results from increased body weight or weakness of foot muscles which have been overstretched by malposition of the various bones, improper shoes, or improper walking.

The author describes in detail the anatomy and function of the active foot, emphasizing the fact that ligamentous strain which produces flatfoot is due primarily to the loss of tension and balance in the muscles, chiefly the supinators and flexors. Outward rotation of the calcaneus and descent of its anterior portion mean flatfoot. Predisposing causes include sedentary pursuits and other conditions which prevent full function of the feet.

Distinction must be made between disability and deformity. Physiological pronation produces disability whereas anatomical pronation causes deformity which may or may not constitute a disability.

Formerly deformity was wrongly estimated by means of soft-tissue prints, roentgenological estimation from the lateral aspect of bone displacements of the passive foot, and casts of the non-weight-bearing foot made for correction and to obtain the specifications for shoes. The estimation should be made from the active foot. For this the author uses his "rotameter," an instrument the chief feature of which is a platform to be placed under the feet, each half of which can be tilted until the external promontory of the tubercle of the os calcis lies anteroposteriorly to the lower border of the external surface of the trochlea of the talus. A solid post carrying an adjustable cross arm at the level of the inner surface of the talus stands midway between the inner malleoli to correct the rotation.

With the feet thus exactly corrected and the ball snugly secured by a transverse strap, a mould of the foot is made. The heel support made from this mould tilts the heel like the Thomas heel. It serves also to keep the astragalus from slipping further inward and downward as the position of correction made by the post on the rotameter is retained by the lateral portion of the heel plate.

In addition to the use of this mechanical device the circulation should be stimulated by daily massage and passive motion with special attention to dorsal flexion. Exercises also are of value, the most important being active, slow, and firm contraction of the toes, the patient standing with the toes over the edge of the pedestal. Walking straight instead of toeing out is another important factor in the correction of the condition. R. G. PACKARD.

**Carling, J.: The Treatment of Weak or Flat Feet, with Report of a New Combination Foot Support.** *Mil. Surgeon*, 1920, xlvii, 423.

The author gives a brief description of the anatomy and function of the normal foot. He states that weak or fallen arches are due to ligamentous strain after weakening of the muscles of the foot. Following such weakening the muscles of the foot, calf, hip, and lower back work at a disadvantage.

In the treatment the first requisite is a properly fitting shoe with a moderately low heel and sufficient room for the toes. In addition the author recommends the use of an arch support and describes one of his own which he claims will meet all requirements.

Carling's arch support consists of: (1) a full-length flexible insole bearing on its under surface two compartments to be filled with felt or other resilient material to raise the longitudinal and transverse arches; (2) a supinating wedge of leather attached to the under surface, the purpose of which is to raise the inner border of the foot; and (3) a light steel spring underneath the supinating wedge which serves as a counter-support to the longitudinal arch and, by strengthening the shank of the shoe, maintains the efficiency of the support. The support is light, flexible, adjustable, comfortable, simple, and efficient. R. G. PACKARD.

**Bryan, L.: Bony Changes in Feet following Fracture of the Vertebrae.** *Am. J. Roentgenol.*, 1920, n. s. vii, 125.

The author cites two cases in detail in which fractures of vertebrae were followed by bony changes in the feet. In the first case the astragalus and some of the metatarsals and phalanges were involved. The changes were mainly in the nature of erosions, although there was also a slight tendency to hypertrophic change. In the second case some destruction and slight hypertrophy occurred in the os calcis. In both cases an interval of several years intervened between the time of the injury to the spine and the changes in the feet.

In the author's opinion such changes are due at least partially to repeated trauma.

ADOLPH HARTUNG.

## FRACTURES AND DISLOCATIONS

**Saner, F. D.: The Plating of Simple Fractures.** *Lancet*, 1920, cxcviii, 812.

The author points out that two main principles must be observed in the treatment of any fracture: (1) the bone must be restored as nearly as possible to its original anatomical line; (2) the complete function of the joints above and below the site of the fracture must be maintained. These principles are interdependent. Simple fractures may be treated by means of accurate splinting or by open operation. Saner favors the latter and explains how some of the main objections to it may be overcome.

Careful technique and the avoidance of postoperative hæmorrhage are important factors in the prevention of sepsis. It is desirable also to make the incision sufficiently large to prevent traumatism during the manipulation of the fragments. The plates and screws do not often cause after-effects necessitating their removal.

After the operation a suitable Thomas splint should be used to immobilize the limb. This type of splint makes it possible to move the patient at an early stage of the treatment. On the tenth day the dressings should be changed and the splint applied less firmly in order to permit some movement. After the third week massage and both active and passive movement should be begun, at first very gently.



In cases of fracture of the lower limb it is not wise to allow the patient to walk, even with crutches, until firm union is obtained. G. S. FOULDS.

**Orr, H. W.: Points To Be Observed in the First Ten Days of the Treatment of Compound Fractures.** *J. Orthop. Surg.*, 1920, ii, 196.

■ In cases of fracture immobilization is of secondary importance to correct position but both are essential for successful results. The promotion of bony union by rubbing the ends of fractured bones together is not advisable.

Military experience taught that the simplification of apparatus made it possible for large numbers of surgeons to do excellent work in a short time.

Plaster of Paris applied by the Whitman method is of value in fracture of the neck of the femur.

During the war patients with fracture of the humerus which in many instances involved the elbow were sent to the hospitals with the arm in a straight Thomas splint, the elbow being straight and the hand pronated. In many of these cases neither normal relationship nor immobilization had been obtained. Following the teaching of Jones, the rule was then made that every fracture of the humerus was to be taken out of its straight Thomas splint, the elbow flexed and the hand supinated and dorsiflexed. The only exceptions to the supination of the hand were the few cases of patients who expected to be employed later in work which required the hand to be held with the palm downward on a table. After such manipulation the hand was fixed in plaster of Paris, often with a body cast, or carefully bandaged into a Jones humerus traction splint or an aeroplane splint.

The Thomas splint should always be applied in the same manner. Individual methods invariably lead to a loss of efficiency as patients pass from one surgeon or hospital to another. In the application of this splint to fractures of the leg the following points must be observed:

A long splint with a well-fitting ring must be selected. It must be bent to an angle of 10 or 15 degrees at a point 1.5 in. above the level of the knee joint. With regard for the wounds, the adhesive traction bands must include as much skin of the leg and thigh and extend as high as possible. The traction ropes for twisting attached to the lower end of the adhesive should be of 0.25 in. rope or 4-ply

muslin fastened very securely into the adhesive so that it will not give way under a pull of even 15 or 20 lbs. Muslin hammocks not more than 4 in. wide should be placed across the splint for its entire length at a sufficient tension so that the leg rides well on top of the splint. The splint should then be applied and the traction straps tied firmly over the lower end, the ring tight against the tuberosity of the ischium. A right-angle foot-piece should be applied next and the foot and knee bandaged in such a way as to put the entire extremity at rest in the splint. The twisting of the traction bands should have attention once or twice daily. The lower ends of the splint should be tied to the outer end of the foot of the bed in such a position that the lower end of the femur rotates slightly outward. The foot of the bed should be raised 12 in. so that the patient's body acts as a counterweight.

The author expresses the hope that the four or five standard splints used by the A. E. F. will come into general use in this country and that most of the other methods and forms of apparatus will be discarded. L. C. DONNELLY.

**Lemon, C. H.: Suggestions for the Treatment of Fracture of the Radius and Ulna at the Middle Third.** *Wisconsin M. J.*, 1920, xviii, 465.

Next to fractures of the hip, fractures of the middle third of the forearm are the most difficult to treat. Since the relation of the flexors and pronators to the extensors and supinators is as 3 is to 2, a loss of balance results from a fracture of this kind, the flexors becoming the bowstring which tightens from day to day and shortens the line from the palm to the elbow.

The treatment must include fixation of both the wrist and the elbow to be used for extension. The position of full supination, not semi-pronation as the text-books advise, must be used. Plaster of Paris gives the best fixation and should be doubly reinforced at the point of fracture. After the acute swelling has disappeared the arm should be fixed in overcorrection as otherwise outward bowing will take place within the cast.

The retentive dressing must not be removed too early. For the first few days ordinary coaptation splints should be used with double padding opposite the site of fracture to secure overcorrection. These need not extend above the elbow. R. G. PACKARD.

## MISCELLANEOUS

### CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

**Sandiford, I.: The Basal Metabolic Rate in Exophthalmic Goiter (1,917 Cases), with a Brief Description of the Technique Used at the Mayo Clinic.** *Endocrinology*, 1920, iv, 71.

The author defines the basal metabolic rate of an organism as "the minimal heat production of the

organism from twelve to eighteen hours after the ingestion of food and with that organism at complete muscular rest." This rate may be estimated by direct or indirect calorimetry, the latter being an analysis of the end products of oxidation within the organism.

The author reviews the investigations on the subject from the research of Lavoisier to the present

time and discusses the various methods used in the estimation of the basal metabolic rate. The best apparatus of the closed-circuit type is that of Benedict, but for general clinical work the gasometer method described by Tissot in 1904 is considered better.

The procedure used in the metabolism laboratory at the Mayo Clinic is described in detail. An average of 30 estimations are made each day and the chance of technical error has been reduced to less than 1 per cent of the tests.

The determination of the basal metabolic rate is of the greatest value in dealing with disorders of the thyroid gland as it is a very accurate mathematical index of the degree of functional activity. In exophthalmic goiter the metabolic rate may rise to more than 100 per cent above normal, while in myxoedema with apparently complete cessation of the thyroid activity it may fall to about 40 per cent below normal. In milder cases of either group the variations from the normal are proportionately smaller. No definite instance of an increased basal metabolic rate has been found in patients suffering from neurasthenia or chronic nervous exhaustion. The basal metabolic rate has therefore proved to be of great value in the differential diagnosis of neurosis simulating hyperthyroidism and true hyperthyroidism.

The result of treatment in disorders of the thyroid gland may be estimated accurately by following the change in the basal metabolic rate. The general effect of the treatment adopted at the Mayo Clinic for severe cases of exophthalmic goiter is illustrated by the following data: "In a group of 22 patients the average basal metabolic rate before treatment was instituted was +66 per cent, with a pulse rate of 123. As a result of rest in bed and two ligations the rate in these patients before they went home had decreased to +46 per cent and the pulse to 115. The further improvement that occurred from three months' rest at home reduced the average metabolic rate to +39 per cent and the pulse rate to 107, and finally, after thyroidectomy and just before the patients were discharged from the Clinic, the rate was +16 per cent and the pulse 89."

G. S. FOULDS.

**Macadam, W.: On the Histologic Resemblances of Oriental Sore to Epithelioma.** *Brit. J. Surg.*, 1920, vii, 487.

The author, while in the East, examined histologically a number of excised skin lesions of the type of Oriental sore sometimes called Baghdad boil or Delhi sore. Most of these showed the characteristics of a chronic ulcer, those which were more chronic having an epithelial downgrowth at the margins. Macadam describes especially the lesions in 2 cases which histologically were practically indistinguishable from squamous-cell carcinoma.

One of these was a solitary sore excised from the forearm of a soldier. After staining, the smears from the pinkish granulation-like material in the

cutis vera showed typical *Leishmania tropica* bodies. Histologic examination showed marked downward infiltration by epithelial proliferation and many cell nests. There was no evidence of endothelial proliferation within the blood vessels. Considerable round-cell infiltration (mostly lymphocytes) and large endothelial cells, but no giant cells were seen. Following the excision, the wound healed by first intention.

The second lesion described was an ulcer excised from the lip of a patient having multiple Oriental sores. In this ulcer the *Leishmania tropica* bodies were found in smears and the histologic appearance was similar to that of the first sore described. The lesions healed following treatment with intravenous injections of antimony tartrate.

In both cases there was no evidence of clinical malignancy. While true carcinoma may develop in a certain number of these ulcers, Leishmaniasis appears as a rule to be a self-limiting infection even when untreated and no carcinomatous lesions have resulted in animals after inoculation with Oriental sore.

As the lesions described resemble the squamous-cell carcinoma histologically, it is important, if possible, to detect the presence of the *Leishmania* bodies. Various means of obtaining smears are described. In cases of long standing the Leishmanian bodies tend to disappear. J. E. MCCORVIE.

**Champay, G., and Coca, F.: The Pathogenesis of Cancer and Cultivation of Tissues** (Patogenia del cancer y cultivo de tejidos). *Med. Ibero*, 1920, x, 73, 93.

The growth described by the author was a small, pedunculated, polypoid tumor in the cavity of the cervix, somewhat club-shaped but not protruding outside of the cervical canal. As a result of biopsy done upon the free extremity a diagnosis of endocervical epithelioma was made and a hysterectomy was performed.

The greater part of the tumor was made up of a simple polyp or polypoid adenoma in which there was no evidence of cancerous change. Malignant degeneration was present only at the tip where the tissue was originally excised for microscopic examination. The polyp was completely enclosed by epithelium similar to endocervical mucosa. The tumor mass consisted of rather friable and vascular new connective tissue, and many glands resembling those of the endocervix. The glands were perhaps less deeply invaginated than in similar polyps. The superficial epithelium was formed of mucous cells with cytoplasmic granulations. At the free margin a border of coarse and short cilia was present, the longer cilia being nearer the center of the cell. As these cells give the mucous reaction in staining they were probably at one time ordinary ciliated cells which had undergone mucous degeneration. The nuclei were crowded close to the base by the mucous material. The connective tissue was embryonic in type and contained many eosinophile leucocytes.



The malignant portion showed the typical histologic character of a glandular cancer. The exact point at which the carcinoma began could not be determined but there was a relatively large transitional zone in which the intermediate changes between normal glands and cancerous tissue were found.

The glands situated in the transitional area were more irregular in outline and had a more rapid growth than those in the remaining portions of the tumor. The cells were more closely packed and formed invaginations which often made the lumen irregular and partially obstructed it. The epithelial cells were simple in type with the mucous cytoplasm and nucleus very distinctly stained and often indented. These cells multiplied by amitotic division. No mitotic figures were observed.

At certain points a modification which seemed to represent a malignant tendency was manifested by the stratification of the cells into two or three layers. The lamina of the cells next to the lumen usually conserved its typical glandular type while the underlying cells changed so that there was no indication of their original function. The stratification began in the base of an invagination into the gland lumen as though due to the piling of the cells upon each other. With this disordered arrangement the deeper cells lost their glandular characteristics and reproduced undifferentiated epithelial cells not of the glandular type. They thus assumed new histological characteristics which allowed them to proliferate rather than to functionate.

The cells in the cancerous portion differed greatly from the glandular type. In the adenoma the cells multiplied by cleavage and there were no mitotic figures in the transitional zone. In the malignant portion, however, mitotic divisions were quite numerous. It thus appears that multiplication first continued in the proper way, the atypical proliferation of malignancy following later. Some unknown influence was thought to permit proliferation but not to provoke it. This theory has been adopted as the result of a series of investigations by Champay in which it was found that cells so differentiated that they did not divide by mitosis exhibited active proliferation when cultivated *in vitro*. A large series of observations demonstrated that mitotic multiplication was impeded *in vivo* by certain influences which are as yet undetermined, but that the tissue elements really possessed the ability to multiply indefinitely. In neoplasms there is a condition permitting the renewal of cell multiplication, the neoproliferation being explained upon the basis of a suppression of inhibition rather than an excitation.

In the cancerous glands the inner or superficial layer of cells conformed more nearly to the glandular type, the underlying cell showing markedly different cytological characteristics. These cells were smaller, the nuclei were more spherical and clearer, there were no notches, and chromatin was arranged in two or three masses. The nucleolus was usually quite distinct. The cytoplasm was finely granular and contained no mucus nor mucogenic substances. The

outlines of the glands were irregular and varied greatly in size. Cell groups could be isolated in the connective tissue or appeared in trabeculae. Pluripolar mitoses were seen in these cell groups. The connective tissue between cancerous glands was not infiltrated by leucocytes except in the areas undoubtedly infected. The infiltration of eosinophiles so abundant in the non-cancerous portion was absent in the malignant area. The epithelial margin enclosing the entire polyp exhibited no deviation from the normal structure except that in certain areas it was broken.

In view of the infrequency of the kind of cancer described it was decided to cultivate it in plasma immediately after the operation. Portions of the tissue were taken first from the highest point as it was believed that the whole tumor was malignant. These implants were therefore obtained from the non-cancerous portion. Cultures of the cancerous portion taken later continued multiplication with no change in the type of cell. The cultures from the benign portion were of interest because they demonstrated so well the mechanism of transformation to malignant tissue.

A series of fragments were implanted and examined at intervals varying from one to eight days. During the first day the glandular epithelium changed its aspect completely. The cells lost their mucous character and became cuboidal in type. In general this may be termed the loss of specific organic character with conservation of epithelial nature. The form of the nucleus changed also, becoming more spherical and staining more lightly. The connective tissue showed a tendency to cicatrize, the epithelial cells moving about in amoeboid motion and arranging themselves as if to cover the segment of tissue again in the least time possible. This phenomenon was observed during the first two or three days of culture. Later the epithelial cells underwent curious modifications resulting in the formation of cilia which finally covered the entire free surface of the cells in a fine fringe. This formation began at the surface of the most superficial cells with the largest mass of cytoplasm. The connective tissue did not undergo important transformation. Vessels became obliterated and disappeared. In the periphery of the sectioned fragments were found bits of connective tissue extending out from the epithelium. Continued epithelial proliferation finally resulted, however, in the enclosure of such protrusions. After small protrusions were thus covered, stratification began, the deeper cells assuming the characteristics of malignancy. Proliferation then continued by mitosis. Isolated epithelial elements proliferated in circular form, later becoming stratified and resembling the cell nests of a cancer.

In conclusion attention is called to the similarity of the epithelial tumor and cultures from the tissue from which the tumor was derived. In both there was partial loss of differentiation. This parallelism does not mean that the cause is identical in the two cases but that the mechanism of genesis of atypical



cells in both cases is almost identical. The investigations, therefore, do not attempt to explain the cause of malignant neoplasms but demonstrate how this unknown cause acts.

W. R. MEEKER.

**Whitman, R. C.: A Study of Four Cases of Beginning Squamous-Cell Carcinoma of the Cornifying Type.** *J. Cancer Research*, 1920, v, 155.

The carcinoma cell is a new variety of cell arising by somatic mutation from a normal cell existing either as a cell rest or normally intercalated in the tissues of the host and retaining in almost every case enough of the properties of the parent cell to render its point of origin recognizable within certain limits.

The cause of such mutative changes can be only surmised but apparently they are favored by hybridization and mongrelization and are more immediately brought about by chronic irritations which maintain long-continued efforts at repair, particularly when, as in the case of X-ray and radium, such irritants exercise a specific power to interfere with the mitotic process.

Such mutations are apt to recur from time to time in the growing tumor, bringing about a progressive loss of the original character of the mother cell and a change in the clinical behavior of the tumor.

In many cases, therefore, the biological properties of a carcinoma are not constant or uniform, but vary from time to time and from region to region of the tumor.

Since the histogenesis of a carcinoma is a gradual process, its real beginning must actually antedate visible changes in the cell by perhaps a long period.

The particular characteristic of squamous-cell carcinomata depend not upon the tissue of origin, but upon the character of the responsible mutative change.

SAMUEL KAHN.

### BLOOD

**Graham, G. S.: The Hæmic Basophile.** *J. Exper. M.*, 1920, xxxi, 209.

The basophilic granule exhibits certain physical and chemical reactions that appear to be different from those of the neutrophilic and eosinophilic types. It seems chemically more stable and biologically more inert. A study of the cell forms of the leukæmic blood of man suggested that the metachromatic basic staining granular substance was the result of changes in the granules of the essential or true leucocytes or myelocytes. The progress of the changes leading to its appearance could be followed in the cells showing heterochromatic granulation. In such cells as the ruptured eosinophilic myelocyte the benzidine-active substance appeared to be changed gradually into a substance no longer endowed with the property of reacting to a benzidine solution. This change was taken to imply a fundamental alteration in the nature of the granular material. The concomitant acquisition of a basic staining property of peculiar type served as further evidence of the chemical

alteration. In the cells as a whole there were found all stages of the conversion of an eosinophilic cell filled with active granules into cells the granules of which appeared entirely inert toward benzidine.

The inactive granules were water-soluble but resistant to physical and chemical agents which were destructive to the benzidine-active granular substance. Associated with the granular changes there appeared to be a progressive degenerative change in the nucleus. The nucleus shrank, became more compact and more heavily stained, and took on a crumpled or shriveled appearance. The end-product was a small cell with a gnarled nuclear mass and a thin cytoplasmic envelope crowded with the basic staining remains of its original granules. In some other instances degenerative change went forward less rapidly or, in other words, the cell was able to maintain a metabolism more nearly equal to the normal so that despite the progress of the granular changes it secured as a whole a better approximation to the normal evolutionary course. Under these conditions the nuclear appearance simulated that of the true leucocyte more or less closely, while a considerable amount of cytoplasmic substance remained in which the granules tended to be relatively fewer than in the first case and more lightly stained. This was the type usually found in normal blood, while the smaller type was more typical of leucæmic blood.

The contention that the basic staining granules occurring in the cells of the mixed-granule type are early undifferentiated forms of one or another granular variety did not seem to apply to the preparations described. It is well known that the various peroxidase methods are able to demonstrate a positive granular reaction in cells of the myeloblast stage when the usual stains fail to show any evidence of granule formation. All the evidence at hand indicated that benzidine was quite sufficiently sensitive to accomplish this result. It seemed hardly possible to the author, therefore, that definitely formed granules of essential type could fail to give a benzidine reaction.

From this study the conclusions drawn are as follows:

The basophilic granule of blood and marrow cells did not show the brown color reaction with benzidine solutions that is characteristic of the neutrophilic and eosinophilic granules. It differed from these types also in other important microchemical and physical particulars.

The hæmic basophile which bore these granules was peculiar from a purely cytological standpoint, while physiologically it appeared to be devoid of any functional activity comparable with that of the other granulocytes.

In every instance, at least in mammalian blood, the peculiarities exhibited seemed best explained as evidence that the basophile is a degenerated or degenerating cell derived probably from the eosinophilic cells and perhaps, in rare cases, from those of neutrophilic type.

G. E. BEILBY.



**Krehbiel, O.: On the Calcium Content of the Blood with Special Reference to Cancer.** *J. Cancer Research*, 1920, v, 199.

The calcium content of the blood plasma was determined by the author in 34 cases of malignant disease, in 6 cases of benign tumors, in 11 cases of thrombo-angiitis obliterans, and in 26 miscellaneous cases. The method employed was that of Halversan and Bergeim.

In normal persons the calcium content varied from 9 to 11 mgm. per 100 ccm.

In cancer, the average values were within the figures generally accepted as normal, i. e., 9.41 mgm. per 100 ccm. No characteristic concentration was associated with any given type or location of neoplasm.

In benign tumors the values were similar to those obtained in cancer.

The average calcium figure for thrombo-angiitis was within normal limits, while the variations in individual cases indicated that calcium metabolism is not affected by this disease.

In severe nephritis, eclampsia, and tetany, low calcium values were obtained. SAMUEL KAHN.

#### BLOOD AND LYMPH VESSELS

**Behan, R. J.: Physiological Methods in the Treatment of Varicose Ulcers.** *Am. J. Surg.*, 1920, xxxiv, 106.

Varicose ulcers are the result of circulatory stagnation due to some obstruction in the internal saphenous or femoral vein. The normal valvular action is overcome with resulting engorgement and passive congestion of the leg.

To correct this condition the circulation to and from the ulcerated area must be corrected. The author advises making numerous straight incisions about the area and severing the vessels communicating beneath the ulcer by means of a fine narrow knife.

In the slowly healing ulcer repair may be stimulated by the use of skin grafts from various parts of the body. The proliferating epithelial margin of an indolent ulcer is active in its growth, needs little nutrition, is accustomed to the location in which it is situated, is immune to the pus secretions of the area, possesses great resistance, and is not sensitive.

The author's method of treating varicose ulcers is described as follows:

1. The ulcerated area is made as aseptic as possible and the granulation tissue is removed below the level of the margin.
2. The skin margins are undermined, the bleeding being controlled by pressure.
3. Squares measuring  $\frac{1}{4}$  in. are cut from the margins at distances of  $\frac{1}{4}$  in. These are placed over the ulcerated area not more than  $\frac{1}{2}$  in. apart, pressed firmly to the surface, and covered with a protective elevated dressing.
4. The area is kept moist with salt solution or Ross' solution, and is protected from pressure and

traction. Exposure to sunlight under glass, isinglass, or cello-silk dressing is of great benefit. The growth of the body cells is stimulated by a secretion from the dead or dying body cells called by Ross "cadaverin". Theobromine also acts as a stimulant to cell growth. Ross uses a paste and a solution the formulae of which are as follows:

Solution: Sodium chloride, 0.5 gm.; sodium citrate 1 gm.; theobromine, 1 gm.; water, 100 ccm.

Paste: Sodium chloride, 0.9 gm.; sodium citrate, 1 gm.; tyrosine or theobromine, 1 gm.; sodium bicarbonate, 1 gm.; and water 100 ccm.

M. H. HOBART.

#### GENERAL BACTERIAL INFECTIONS

**Huggins, R. R.: Postoperative Tetanus.** *Surg., Gynec. & Obst.*, 1920, xxx, 142.

Huggins states that in a considerable number of cases of postoperative tetanus reported the condition occurred after a pelvic operation and that this fact makes the subject worthy of attention on the part of the gynecologist.

A study of the histories of these cases and of the various theories regarding the etiology of the complication has led the author to the following conclusions:

Tetanus is a complication which may follow any operative procedure but is more apt to follow abdominal and rectal operations.

More thought should be given to the possibility of its occurrence and because of this possibility green vegetables should be excluded from the diet for several days before an abdominal operation.

At times water may be responsible and therefore should be carefully examined. Catgut may be another factor in the etiology.

Huggins reports a case which he believes was tetanus although the clinical diagnosis made from typical symptoms was not proven bacteriologically. The patient was operated upon for a uterine fibroid. A hysterectomy was done and the cervix amputated. Eight days after the operation she first noted stiffness of the masseters and a few days later stiffness of the muscles of deglutition. Death followed the typical symptoms of tetanus.

There was no evidence of any local infection; the wound healed by primary intention. Cultures of the secretions from the vagina, the wound, and the catgut used revealed nothing significant.

A case such as this suggests also the possibility of false tetanus as the patient gave a history of two previous mild attacks. H. A. MCKNIGHT.

#### SURGICAL DIAGNOSIS, PATHOLOGY, AND THERAPEUTICS

**Nammack, C. H.: The Significance of Yellow Spinal Fluid.** *Am. J. M. Sc.*, 1920, cliv, 540.

Fröin, in 1903, described a syndrome in which the spinal fluid is of a yellow color, contains a marked increase in cells and albumin, and coagulates at once

or upon standing. It is agreed by all who have studied this condition that the coloration is due to the presence of blood pigments, chiefly bilirubin, and the increased coagulability to an increase in fibrin.

The author presents a series of 96 cases of yellow spinal fluid found in the examination of 5,801 fluids, nearly all from acute or subacute types of disease. Yellow fluids obtained after the administration of serum from patients recovering from epidemic meningitis were not included in the series.

Sixty cases in which there were sufficient data to warrant a diagnosis are tabulated and appended. There were 40 cases of tuberculous meningitis, 13 of poliomyelitis, 3 of cerebral hæmorrhage, and 1 each of meningeal hæmorrhage, cord tumor, pachymeningitis, and cerebrospinal meningitis. Tuberculous meningitis was present in 66⅔ per cent of the cases.

The author's conclusions are as follows: (1) yellow spinal fluid occurs in a wide range of diseases of the spinal cord and meninges; (2) the complete syndrome of Froin is comparatively rare; (3) in acute or subacute conditions the presence of yellow fluid strongly suggests tuberculous meningitis or poliomyelitis.

W. H. NADLER.

#### EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

Ascoli, M., and Fagioli, A.: *The Pituitrin Test.* *Endocrinology*, 1920, iv, 33.

The authors have previously described the subepidermal test with adrenalin. In that test, 0.05 ccm. of a 1:1,000 solution of adrenalin causes a swelling which almost immediately becomes dark blue. This swelling later is surrounded by an alabaster-like halo with irregular branches outward. Around the latter appears a red halo which varies in its intensity and width.

The complete reaction to adrenalin injected subepidermally consists then of a central blue spot with a white and red halo surrounding it. The reaction is fully developed in half an hour and within an hour gradually disappears. The central blue spot ultimately becomes a reddish papule and undergoes the usual stages of pigmentation.

When weaker solutions of adrenalin are used (1:200,000—1:1,000,000) the reaction is still definite, but the central blue spot is absent and the external red halo is not intense. A distilled water control is indispensable, especially when the weaker solutions are employed.

In normal persons the test is positive when dilutions of 1:200,000 to 1:1,000,000 are used. The test is subnormal—negative with these weak solutions—in some cases of chronic adrenal insufficiency and Addison's disease. It is increased—positive with dilutions up to 1:20,000,000—in some cases of disturbed menopause, hypertension, Basedow's disease, and pregnancy.

Using commercial solutions of pituitrin in subepidermal injections the authors obtained reactions

identical with those seen when adrenalin in dilutions of 1:200,000 was injected subepidermally. When the commercial solutions of pituitrin were diluted 1:500 the reaction was still positive, but the characteristic white halo appeared late.

The subepidermal pituitrin reaction is increased—positive with dilutions of 1:1,000 or more—in some cases of hypertension, pituitary disease, and Basedow's disease. It is subnormal—negative with the stronger dilutions—in some cases of chronic adrenal insufficiency. In most cases the pathologic reactions to adrenalin and pituitrin are clearly shown dissociated and even opposed.

The technique employed is as follows:

A small area of the skin of the abdominal wall is made tense. In this spot the hypodermic needle is introduced subepidermally so that it is clearly seen underneath the skin. The injection must not be intradermal. One twentieth of 1 ccm. of the solution employed is then injected. In every experiment an injection of distilled water should be given as a control in order to determine the general reactivity of the skin.

SAMUEL KAHN.

Brown, W. H., and Pearce, L.: *Experimental Syphilis in the Rabbit. I. Primary Infection in the Testicle.* *J. Exper. M.*, 1920, xxxi, 475.

The successful transmission of the virus of human syphilis to rabbits in 1906 gave promise of an unusual opportunity to investigate problems relating to syphilitic infection by experimental means. During the years following, numerous methods of inoculation were devised and perfected and the resulting infections were studied in great detail. The hope of obtaining an experimental infection analogous to the human disease by local inoculation, however, was not fully realized. Isolated instances of generalized infection with the occurrence of lesions of various types have been reported from time to time, and while some investigators have obtained such evidence of generalization in as many as 50 per cent of the infected animals, these occurrences have been comparatively rare in the experience of most observers.

In this article the authors report a study of the infections produced in rabbits inoculated in the testicles with two strains of *spirochæta pallida* which had been carried in rabbits for several years. Infection resulted in all instances. The incubation period varied as a rule from two to six weeks and under properly chosen conditions could be reduced to approximately three weeks or less.

The infection pursued a typically cyclic or relapsing course and affected both the spirochætes and the associated lesions in the testicle. The spirochætes in the local lesions exhibited periodic changes less marked and less regular but identical in character with the changes occurring in the blood in cases of relapsing fever. The lesions in the testicle also showed periods of active development and quiescence or regression which followed closely upon the changes exhibited by the spirochætes.



The specific reaction in the testicle showed considerable variation in the speed and sharpness with which successive phenomena occurred as well as in the character and extent of the processes themselves. These reactions were of two fundamental types. In one group of animals the reaction was characterized by an intense cycle of acute exudation and infiltration, with a lesser degree of proliferation, followed by crisis and subsequent recurrence of secondary cycles of proliferative reaction of a minor degree.

In the other group of animals the reaction was more chronic in character and consisted largely of infiltration and proliferation. The progress of the reaction was more gradual, and sharp alterations in its course were absent. The infection progressed with slight and irregular remissions.

In the third group of animals the reaction was sub-acute, combining at the same time the processes of exudation, infiltration, and proliferation. The first cycle of reaction was fairly acute and terminated in a definite crisis with moderate regression followed in turn by recurrence and more or less pronounced secondary cycles of proliferation.

In all cases of definite infection there was diffuse involvement of the testicle, tunic, epididymis, and cord, but as the infection progressed the lesions underwent many transformations so that a variety of lesions were formed from processes which in the beginning were of a common type. Eventually the reaction became more irregular and the infection became centered in one or more foci which were commonly situated in the epididymis, tunic, scrotum, or mediastinum testis. These centers served as residual foci of infection.

The duration of the testicular process was found to be exceedingly variable. In some animals the entire reaction consisted of but a single sharp cycle and the local infection was terminated by crisis within four or six weeks after inoculation. As a rule the period of active infection persisted from two to four months, and quiescent or inactive lesions not infrequently continued for from four to six months. In exceptional instances local infection persisted for more than a year.

G. E. BEILBY.

**Bullock, F. D. and Rohdenburg, G. L.: Fluctuations in Concomitant Immunity.** *J. Cancer Research*, 1920, v, 129.

The variations in the percentage of induced immunity obtained by the methods commonly used in immunizing animals against transplanted tumors are well known.

The experiments reported by the authors were planned to determine fluctuations in concomitant immunity and to discover the factors responsible for them.

Three tumor strains were used, the Buffalo rat sarcoma, the Flexner-Jobling rat sarcoma, and the English mouse carcinoma 63. A standard technique was used in order to eliminate variations due to differences in procedure. The animals were inoculated with 0.003 gm. of the given tumor strain.

Eighteen days after the primary inoculation a reinoculation was done in the tissues of the opposite side of the body with a similar dose of the tumor strain. The tumor used for the second inoculation was selected from the tumors resulting from the first inoculation. The final figures were based on the condition present on the twenty-fourth day of the second graft.

Concomitant immunity, as observed through six generations of the Buffalo rat sarcoma ranges between 100 and 65 per cent, a variation of 35 per cent. The variations observed through seven generations of the Flexner tumor are similar to those noted in the Buffalo tumor, 38 per cent. To obviate the factor of familial or racial tendencies a pure strain of mice was used for the mouse carcinoma 63, both tumor strain and animal being of English stock. Through eight generations of this tumor more frequent and more marked variations than in the two preceding tumors were noted. The concomitant immunity ranged between 21 and 60 per cent, a variation of 39 per cent. With all the strains no relationship could be established between the variation in induced, concomitant, and natural immunity.

The fluctuations in concomitant immunity are not due to differences in the host strain and cannot be connected with similar fluctuations in either induced or natural immunity. The vacillations must be the result of differences in the tumor itself. If they are caused by fluctuations in the growth energy of the tumor, then growth energy must be measured not by the infectivity of the tumor, as indicated by the number of takes, but by the rapidity of growth of a single given tumor.

Concomitant immunity in the author's experiments occurred most often when the individual tumor grew slowly but steadily and least often when the tumor grew rapidly. Whatever the cause of the variations noted, their presence is proof of the inconstancy of tumors as immunizing agents.

SAMUEL KAHN.

**Hoskins, E. R., and Hoskins, M. M.: The Inter-Relation of the Thyroid and Hypophysis in the Growth and Development of Frog Larvæ.** *Endocrinology*, 1920, iv, 1.

A preparation of the anterior lobe of beef hypophysis when administered to normal frog larvæ results in a precocious metamorphosis. If the original larvæ are small, they never become as large as the controls and the resulting frogs are small and of low vitality. When exposed to the air, they die and dry almost flat, probably because of their high water content. When the original larvæ are large, the pituitary substance has a less marked toxic effect.

When the preparation employed was administered to thyroidless larvæ which would remain in larval form indefinitely, metamorphosis began in twenty-four hours, but progressed slowly. It was nearly complete when the animals died or were killed.

In amphibian metamorphosis the hypophysis is to be ranked with the thyroid. Physiologically they are closely related and to some extent may function vicariously. The results obtained in the experiments reported were due probably to stimulation of the general metabolic processes. The effect is partly progressive (in the skeletal and cutaneous development, due to stimulation of the calcium and phosphorus metabolism) and partly retrogressive (in the development of the digestive tract and tail).

The action of the anterior pituitary substance is probably due not entirely to its iodine content as other tissues containing traces of iodine do not produce the same results.

Recent investigations with amphibian larvæ have demonstrated the following facts:

1. Removal of the thyroid hastens growth, causes hyperplasia of the hypophysis, and prevents metamorphosis.

2. Removal of the hypophysis retards growth, retards development of the thyroid, prevents metamorphosis, and retards the development of cutaneous pigment.

3. Feeding thyroid, hypophysis, or iodine to normal larvæ hastens metamorphosis.

4. Feeding thyroid, hypophysis, or iodine to thyroidectomized larvæ brings about metamorphosis.

5. Feeding hypophysis to hypophysectomized larvæ stimulates growth but does not cause metamorphosis.

6. Feeding iodine to larvæ from which both the thyroid and hypophysis have been removed causes metamorphosis.

SAMUEL KAEN.

**Teale, F. H., and Bach, E.: The Nature of the Serum Antitrypsin and Its Relation to Autolysis, and the Formation of Toxins in Infection and in Anaphylaxis.** *Proc. Roy. Soc. Med.*, Lond., 1920, xiii, Sect. Path., 5.

The authors discuss their subject under the following heads and subheads:

The nature and properties of antitrypsin: the antitrypsin of egg white, relation to lipoids, the isolation and properties of antitrypsin.

Serum antitrypsin: the action of lipid solvents on dried serum and ordinary serum; the results of endeavors to isolate serum antitrypsin; soaps as antitrypsin agents; inhibition of antitrypsin by acids and alkalis, temperature, incubation; absorption of antitrypsin; mode of action of antitrypsin, and antitrypsin in albumin fraction of serum.

Autolysis of the serum: results of incubation without destruction of the antitrypsin and after destruction of the antitrypsin; sensitiveness of the ferment to de-antitrypsinizing agents, reaction, temperature, and absorption of the ferment.

Autolysis of solid tissues: (1) liver: importance of complete bacteriological sterility, effect of reaction, bacteria, phosphorus, and bacterial toxæmia; (2) leucocytes and marrow.

Relation of antitrypsin to tissue autolysis: the existence of a tissue antitrypsin; the influence of

serum antitrypsin in tissue autolysis in the liver, bone marrow, etc.

The relation of these experiments to bacterial toxæmia, anaphylaxis, and anaphylotoxin.

The article is based on a long series of experiments. The conclusions drawn in regard to the nature of serum antitrypsin are: (1) it is protein in nature and not lipoidal; (2) it is not absorbed by bacteria or colloids; (3) the serum contains a weak proteolytic ferment; (4) it is destroyed by a temperature of 56 degrees C. and by weak acids and alkalis to N/400; and (5) it does not influence tissue autolysis.

It was found that under conditions of absolute bacteriological sterility tissue autolysis is quite slow.

With regard to the occurrence of autolytic degradation in infection and anaphylaxis the authors do not agree with Jobling.

G. E. BEILBY.

**Teale, F. H., and Bach, E.: The Relation of the Antitryptic Titre of the Blood to Bacterial Infection and Anaphylaxis.** *Proc. Roy. Soc. Med.*, Lond., 1920, xiii, Sect. Path., 43.

The authors record their observations on the variations in the antitryptic titre of the blood of animals during various stages and degrees of bacterial infection and anaphylactic shock. In addition they include observations on the alteration in the antitryptic titre of the serum when anaphylotoxin is produced *in vitro*. So far they have been unable to find any records of previous systematic study of these variations, the observations reported being chiefly scattered clinical observations.

In the authors' investigation the changes in the antitryptic power of the blood were determined in:

1. Normal animals infected with or inoculated with (1) non-pathogenic bacteria; (2) heterogeneous non-toxic protein; (3) pathogenic and virulent bacteria; (4) exotoxins; and (5) sensitized bacteria.

2. Immunized animals into which the homologous bacteria were re-injected.

3. Sensitized or immunized animals into which the homologous antigen was re-injected.

Determinations were made of: (1) the variations due to food; phosphorus poisoning, agents destroying antitrypsin *in vitro*, drugs affecting the temperature, drugs damaging blood-forming tissue, and (2) the variation in the preparation of anaphylotoxin *in vitro* and the influence of antitrypsin on the growth of bacteria.

There appeared to be no relationship between the antitryptic curve and the intensity of the infection, the pathogenicity, or the virulence of the infecting organism. Neither was there any relation between the curve and the toxicity of a bacterium to the infected animal.

The experiments disproved Jobling's theory that the toxæmia resulting from bacterial infection is due to the formation of toxic processes subsequent to the removal of the antitrypsin inhibition on the plasma autolytic ferments.

Wright's hypothesis that the viability and consequent infectivity of certain organisms is due to the



removal of the antitrypsin inhibition and the consequent formation of protein degradation bodies for their growth was also disproved. The degradation bodies were formed apparently by autolysis of the tissues due to the increase of the H-ion concentration at the site of the infection.

G. E. BEILBY.

## ROENTGENOLOGY AND RADIUM THERAPY

**Bauermeister, W.: X-Ray Phenomena from the Appendix Region** (Roentgenologisches aus der Blinddarmgegend). *Arch. f. Verdauungskr.*, 1920, xxvi, 121.

The ascending colon becomes filled in from six to eight hours after the ingestion of a contrast meal (citobarium). In disease, shadow spots remain in the cæcum because, as a result of motor insufficiency, the catarrhal bowel wall does not empty itself completely. The appendix is certain to be filled in all cases in which the ascending colon is filled with gas and in cases of fæcal obstruction, such as that due to carcinoma of the ascending colon.

Delayed motility of the barium meal is important. If rests remain for hours or days and the cause is not found in the large bowel, it must be assumed that there is some obstruction or retardation in the appendix itself due to inflammatory changes in its wall. The simultaneous filling of the appendix with contrast material permits the differentiation of ureteral stones or other concretions. The value of this X-ray diagnosis is illustrated with several case histories.

FRANGENHEIM (Z).

**Jordan, A. C.: Radiology in Chronic Intestinal Stasis.** *Lancet*, 1920, cxcviii, 756.

The author opens his discussion by pointing out that the use of radiology as an aid to the diagnosis of disorders of the stomach and intestine brings up questions as to the definition of the normal. On assuming the erect position, the human body evolved structures which are intended to adapt it to the new position. The X-ray study of intestinal stasis has taught us the sites, advantages, and disadvantages of these new structures and their effects on other organs.

Normally the muscles of the anterior abdominal wall keep the viscera in place. Severe stasis is the result of an adverse cycle which begins in infancy. Artificial feeding leads to overfilling of the stomach and this, by weighing down the transverse colon, causes its contents to solidify and stagnate. The tension exerted on the mesentery interferes with peristalsis, straining occurs in efforts to void the solid fæces, and elongation of the pelvic colon results.

The viscera fall if the abdominal muscles fail to support them. Such failure may be due to excessive fatigue or weakening of the muscles by bacterial toxins resulting from stasis. The strain falls on the mesentery, which either slips from its attachment or becomes thickened where the strain is greatest. In the former case, a visceroptosis results, the heavier viscera dropping sometimes as low as the true pelvis.

In the second case nature forms new bands in an attempt to support the viscera. These bands, which may be demonstrated radiologically, are found in various locations such as the hepatic and splenic flexures of the colon and about the appendix and cæcum. A kink may form at some site along the last 6 in. of the small intestine, and another band may descend from the liver to the large bowel at or near the hepatic flexure or to a viscus at a lower level. The obstruction in the bowel is the result not only of mechanical factors but also of a spasm set up for a considerable distance by the irritant action of the band.

In slight cases of unresisted ptosis the cæcum is mobile, but in severe cases it becomes impacted in the deepest part of the pelvis. The backward rotation of the cæcum in the pelvis causes a torsion of the terminal coil of ileum and this in turn results in ileal stasis. Spasm at the ileocæcal entrance may lead to general thickening and hypertrophy of the last 6 in. of the small intestine which in many cases is associated with some degree of dilatation.

Stasis in the large intestine causes catarrh of the mucous membrane. As a result of spasm, the latter portions of the large bowel become reduced in caliber, the cæcum and ascending colon become dilated, and stagnation results. Colitis may lead to the development of a new growth or diverticulitis. Diverticulitis occurs usually in the iliac colon, but may be found on the proximal side of any obstruction or abnormally tortuous portion of the large intestine.

During development in some cases the cæcum becomes attached abnormally high. Under such circumstances it may not descend and the terminal coil of ileum is caught in the bands which bind it to the posterior abdominal wall.

Ileal stasis results in an overloading of the lower coils of the ileum and a consequent dropping of the coils into the pelvis. The traction on the mesentery of the small intestine causes it to fall gradually also from its line of attachment along the posterior abdominal wall. Eventually all parts of the small bowel are involved and the condition produces a kink at the duodenojejunal juncture which leads to distention of the duodenum and pyloric spasm.

The cardiac orifice of the stomach is the highest point of the alimentary tract affected by ileal stasis. As a result of pyloric spasm and its associated enlargement of the stomach there is abnormal traction on the cardiac orifice which sometimes leads to persistent spasm at this site and consequent obstruction and dilatation of the oesophagus.

In intestinal ptosis microbic invasion causes not only a general toxæmia, but also a local infection of the duodenum and sometimes an infection of the stomach. The invasion of the distended duodenum by pathogenic micro organisms is followed by congestion of the mucous membrane and later by ulceration. By extension into the common bile-duct the organisms may cause also a cholecystitis and pancreatitis. In the stomach the microbic invasion

determines the onset of gastric ulcer. The author believes that cancer of the stomach is always preceded by some digestive disorder. Toxic absorption affects every tissue unfavorably. Atheroma of the aorta may result. In other cases the breasts may become subject to chronic mastitis and later to cystic disease which may end in cancer. The thyroid gland may become atrophied, cystic, adenomatous, and finally cancerous. Exophthalmic goiter develops in some cases of stasis. Other results of the condition are chronic pancreatitis which may lead to cancer and glycosuria or true diabetes mellitus. The joints become vulnerable to the tubercle bacillus and the micro-organisms which produce rheumatoid arthritis and Still's disease.

Surgical interference is indicated when a mechanical obstruction is disclosed and in cases showing the end-results of stasis such as cicatricial ulcer of the stomach or duodenum or impacted gall-stones. Medical treatment should consist in the administration of liquid paraffin and other aperients and in hygienic measures such as diet. Mechanical treatment should include massage and abdominal supports. Bacteriological treatment consists of the use of vaccines. In advanced cases in which all other means have failed or are doomed to failure removal of the large intestine may be necessary.

J. F. MCCORVIE.

**Young, W. J.: The Treatment of Pruritis Ani by X-Ray Radiation.** *Am. J. Roentgenol.*, 1920, n. s. vii, 116.

In regard to the etiology of pruritis ani the dermatologist speaks of a neurosis while the proctologist insists that the trouble is symptomatic of pathology higher up in the rectal canal, namely, hæmorrhoids, fissures, proctitis, ulceration, polypi, stricture, cancer, foreign bodies, prolapse, cryptitis, and thread worms. In the treatment the best results are obtained when the proctologist and roentgenologist work together.

The amount of radiation and the number of treatments necessary vary considerably and must be left to the judgment of the roentgenologist. The recurrence of the pruritus depends upon the amount of rectal pathology present. When treatment by the proctologist is necessary for one year the author gives the patient six to eight treatments at weekly intervals and then a rest for three months. Irrespective of the absence of pruritus, he then repeats the treatment, limiting the number of doses if there has been no itching during the interval. The pruritus ani may persist as long as the rectal condition requires treatment by the proctologist. I. W. BACH.

### MILITARY SURGERY

**Shaw, C. G.: The Application of Military Surgery to Civil Practice.** *Med. J. Australia*, 1920, i, 49.

The author summarizes the experience gained in the recent war as regards wounds of the extremities and chest as follows:

### FLESH WOUNDS

All injured and contaminated tissue should be excised, care being taken to leave the important blood vessels and nerves intact.

The wound should be sterilized by the Carrel-Dakin method, with flavine, Wright's salt pack, or treatment with spirit and bismuth-iodoform-paraffin paste.

The Carrel-Dakin method is unnecessarily laborious and requires a skilled staff. The use of bismuth-iodoform-paraffin paste is preferable as it is more simple than, and as effective as, other methods and requires no further attention until the wound is sutured several days later.

The best results are obtained if the wound is left open and sterilized. It may be closed from three to six days later if excision was done within eight hours after the injury. The advisability of primary suture depends upon the following factors:

1. The length of time since the receipt of the injury. After eight hours the infection has spread to such an extent that primary suture is contra-indicated.

2. The nature of the injury. Contusion with devitalization of the tissues predisposes to the development of sepsis.

3. The situation of the wound. Tissues with a good blood supply are less apt to become septic than those with a relatively poor blood supply. Wounds about tendons are very apt to become septic and should never be closed primarily.

4. The obvious cleanliness of the wound. When dirt is ground into the wound it is infected.

5. Loss of blood. An exsanguinated patient is more easily infected than a patient who has had little hæmorrhage.

The war has greatly increased our knowledge of wound bacteriology. Tetanus has been practically wiped out even in war surgery and can be controlled by early prophylactic treatment with antitetanus serum followed by subsequent weekly doses.

If the war had continued gas gangrene would have been eradicated by the use of polyvalent vaccine. The best treatment consists of excision of the part affected. In very serious cases this means amputation.

The tetanus bacillus and the gas-producing organism may not produce infection until after surgical interference or injury to the wound. Such infections are prevented by strict asepsis, thorough washing of the wound, and the use of anti-streptococcus serum.

In healed septic wounds which are later operated upon a septic flare-up often occurs after several months. If such wounds are treated by a course of ionization with salicylates for from three to seven days, operation may be performed in two weeks with less danger of provoking a recrudescence of the sepsis. To prevent the recurrence of sepsis in parts remote from the wound, daily massage should be instituted early, the joints and muscles at a distance being exercised before they have an opportunity to



become stiff. In such cases also no more splinting or apparatus should be used than is absolutely necessary for the immobilization of the fracture.

#### WOUNDS OF THE JOINTS

It has been found that the synovial membranes of joints are not as susceptible to infection as the surrounding structures. The treatment of joint wounds therefore should consist of: (1) thorough excision of all damaged tissues down to the bone; (2) cleansing of the joint, and (3) suture of the synovial membrane without drainage.

Bullet and puncture wounds without injury to the bone should be left alone unless symptoms of infection develop, when treatment should be begun immediately. *Hæmarthrosis* should be aspirated.

Lacerated wounds of the joints without injury to the bone should be operated upon without delay. All injured and devitalized tissue, including the torn edges of the synovial membrane, should be removed, the wound thoroughly cleaned with a weak antiseptic solution such as flavine or simple salt solution, and the synovial membrane sutured without drainage. It is best to close the entrance wound secondarily after from three to six days following treatment with alcohol and bismuth-iodoform-paraffin paste. Movement of the joint should be begun as soon as the reaction has subsided, which is usually in about a week or ten days.

The treatment of wounds of the joints associated with injury to the bone depends upon the joint involved and whether stability is preferred to motion. When ankylosed the limb should be straight. If good motion cannot be obtained in the shoulder it should be ankylosed with the arm abducted and brought slightly forward. A flail shoulder joint is useless as it tends to become adducted. If the shoulder is ankylosed sufficient motion for use can be obtained from the scapula. In the elbow and wrist motion is more important than stability as even a deformed arm, if movable, may be very useful.

Injuries to bone vary from slight cracks to extensive destruction. The injury should be fully exposed and all dirt, foreign substances, and devitalized bone removed.

When the injuries of the articular cartilage are slight a certain range of motion can be obtained. When the articular ends have been extensively injured, excision of the joint should be done to obtain ankylosis in the knee, ankle, and shoulder, and a mobile joint in the elbow and wrist.

In cases of injury to one condyle of the femur or one tibial tuberosity excision of the joint is advisable to permit weight bearing, while if the front of either of these bones or of the patella is damaged, only the injured portion need be removed.

The principles governing the treatment of injuries of the ankle are the same as those for the treatment of injuries of the knee.

In the elbow and wrist motion is necessary. To obtain this in the elbow the injured portion of the bone should be removed, the joint closed, the en-

trance wound treated, and the joint exercised. If the motion obtained is insufficient, the joint may be excised later. The wrist should be treated similarly except that in all injuries the cock-up splint should be applied.

If in extensive wounds of the elbow sepsis can be guaranteed, cleansing of the wound and replacement of the fragments will prevent the formation of a flail joint. If ankylosis results, the joint should be excised.

When there is sepsis and it is necessary to remove so much bone that the formation of a flail joint is unavoidable, an apparatus may be worn to strengthen the joint, bone grafting may be done to form a false joint, or ankylosis may be effected.

As a rule joint sepsis may be prevented by the early removal of all damaged tissue. In some cases of sepsis aspiration will take the place of more radical treatment. Excision of the joint has been successful but may not prevent pain when the patient walks.

#### SURGERY OF THE CHEST

When a thoracotomy is properly performed the blood pressure does not fall. Ten centimeters of the fifth rib or some other rib should be resected on the anterolateral aspect of the chest. The two contiguous ribs should then be separated widely by means of a strong retractor. The lung should then be delivered outside the chest and examined carefully.

Adhesions should be broken by the fingers or the scissors. By means of a head light the entire cavity of the chest and the wall of the mediastinum should be examined. All foreign bodies, devitalized tissue, and pus should be removed and bleeding points ligated and sutured. The chest wall should be closed in layers. Aspiration of the air by a needle will hasten the expansion of the lung.

Wounds of the chest should be treated like other wounds. Many penetrating chest wounds and those due to small fragments may be left alone if uncomplicated by hæmorrhage or infection. The indications for surgical interference are:

1. *Hæmothorax*. In the absence of other indications for thoracotomy, aspiration is indicated. In this way the culture medium for the growth of bacteria is removed and the danger of adhesions is minimized. Infection occurs in 40 per cent of cases of hæmothorax. Its source is in the missile, in in-driven clothing, or the lung itself. In all cases of hæmothorax a bacteriological examination should be made daily until the danger of infection is past. If infection other than streptococcal infection occurs and is discovered early, a thoracotomy should be done, the pleural cavity mopped out, and the chest wall closed. If empyema develops drainage must be instituted.

2. *Hæmorrhage*.

3. *Open thorax*. This is a condition in which the air passes in and out of the pleural cavity with respiration. Death may occur from asphyxiation or infection. The treatment indicated is thorough

cleansing and excision of the wound and closure of the chest wall.

4. The presence of foreign bodies, damaged or infected tissues, or effused blood.

#### COMPOUND FRACTURES

Cases of compound fracture should be operated upon with the least possible delay. Dirt, devitalized tissue, and blood clots should be removed as in other wounds. In the absence of comminution broken surfaces should be cleaned and approximated. When there is comminution the free fragments and those with only slight periosteal covering should be removed and those which are attached should be cleansed and replaced.

The French method of removing comminuted fragments and leaving the periosteum gives good results. The other method of removing all fragments after cleansing was not successful during the war but might be successful in certain types of fractures seen in civil practice.

It is best to delay the closure of the wound until after a few days of sterilization. If sepsis is prevented the results will be successful, but if it is not prevented malunion, non-union, or chronic osteomyelitis is apt to follow. Acute osteomyelitis seldom developed after a fracture of this kind during the war.

M. H. HOBART.

#### LEGAL MEDICINE

##### Chiropractor as Assistant to Regular Physician.

*State vs. Young (Mo.) 215 S. W. R., p. 499.*

In this case the questions before the court were whether or not a chiropractor is a physician and whether or not an assistant to a regular physician is said to be practicing medicine. The facts were as follows:

The defendant, Young, was convicted of practicing medicine without a license from the State Board of Health and fined \$50.00. On the trial of the case he admitted that he was a chiropractor, but contended that a chiropractor does not practice medicine or hold himself out to be a physician. The court, however, held that such a practice would come under the classification of the practice of medicine. Young contended also that he was an assistant to a regularly-licensed physician and working under his directions, but the court held that he could not escape the effects of the statutes by showing that in practicing he was employed and directed by another.

J. A. CASTAGNINO.

##### Contributory Negligence of Patient. *Hanson vs. Thelan (N. Dak.) 173 N. W., p. 457.*

The question considered was whether or not the contributory negligence of a patient will relieve the physician from liability for negligence.

The plaintiff brought an action for damages for malpractice against Thelan, a physician, alleging that he so negligently and carelessly treated a fractured limb that erysipelas developed and made

it necessary for the plaintiff to remain in bed for many weeks. The defendant contended that Hanson, against his orders, walked on the leg too soon after the fracture and therefore it was the plaintiff's negligence rather than his own which was responsible for the erysipelas. The lower court entered a judgment for the plaintiff and the defendant appealed.

The upper court held that contributory negligence on the part of the person injured will relieve the party charged with the injury from liability. In this particular case, however, the evidence clearly showed that walking on the fractured limb too soon did not cause erysipelas, and that the negligence of the physician in lacing the boot too tight was the proximate cause. The judgment of the lower court was affirmed.

J. A. CASTAGNINO.

##### Examination Required to Determine Injury to Eye.

*Hollon vs. Jones (N. M.) 183 Pac. R., p. 395.*

The plaintiff brought an action for damages for injuries to his eye and in the trial of the case exhibited the eye to the jury. The defendant requested the court to order the plaintiff to submit to an examination by three physicians present in the courtroom, but the court refused to enter such an order and entered judgment in favor of the plaintiff.

Upon appeal the upper court held that when in a personal injury case the plaintiff voluntarily exhibits the injured part of his body to the jury for inspection the portion of the body so exhibited becomes an exhibit in the case and can be examined by the defendant. The court further held that if a defendant can employ an expert in other cases he can employ an expert in a personal injury case to determine the nature and extent of the injuries. The judgment of the lower court was reversed and an order for a new trial for the defendant was entered.

J. A. CASTAGNINO.

##### Hospital Treating White Patient as a Colored One.

*Collins vs. Oklahoma State Hosp. et al. (Okla.) 184 Pac., R., p. 946.*

Lee Collins, an infant, was adjudged insane by the court and committed to the Oklahoma State Hospital for the insane. She was a white child born of white parents but was placed in the colored ward and the word "colored" was written after her name on the chart. When her father wrote to the hospital inquiring as to her condition the reply from the hospital mentioned her name with the word "colored" after it. The father of the girl brought an action for libel against the hospital on the ground that the Oklahoma Statutes provide that it is libelous *per se* to write of or concerning a white person as if the said person were colored.

The lower court held that to sustain an action for libel there must be a publication of the alleged libelous statements and in this case placing the word "colored" after the name of the child on the chart was not a publication as no one but the agents of the hospital saw the chart. Neither was the letter



written to the father a publication as such a letter was a privileged communication.

The father appealed the case, but the upper court sustained the finding of the lower court.

J. A. CASTAGNINO.

**Injured Employee Treating Himself.** *Banner Coffee Company et al. vs. Industrial Commission et al. (Wis.)* 174 N. W. R., p. 544.

The question under consideration was whether or not the failure of an employee to consult a physician relieves the employer from liability. The facts of the case were as follows:

The widow of a former employee of the Banner Coffee Company filed a claim with the Industrial Commission for the death of her husband who died from the effects of an injury received in the course of his employment with the Banner Coffee Company. The Commission made an award of \$3,000.00 and this award was affirmed by the Circuit Court. The Banner Coffee Company appealed.

When the employee was injured he did not consider the injury serious and continued to work, merely dressing the wound with carbolic salve as he was accustomed to do with similar injuries. One of the officers of the company told him to see a certain physician but did not say that this physician was the physician of the company or that the company would pay for his services. It was the contention of the company that the death was due to the failure of the employee to consult a physician rather than to the original injury.

The upper court held that the average laboring man does not go to a physician every time he has a slight injury, and the fact that the employee of the Banner Coffee Company had been accustomed to use carbolic salve whenever he received such an injury justified him in using it in this case. It was the duty of the company to see that he consulted a physician. Merely telling him to see one and not explaining to him that the physician recommended was the company's physician and that his services would be paid for by the company would not relieve the company from liability. The finding of the Industrial Commission and the circuit court was affirmed.

J. A. CASTAGNINO.

**Privileged Communications—Waiver—Conversations after Relations Have Ceased.** *Arnold vs. Ft. Dodge D. M. & S. R. Co. (Iowa)* 173 N. W., p. 252.

The plaintiff, Arnold, fell on the tracks of the defendant railway company in his attempt to escape being hit by a reckless automobile driver. The

evidence showed that he tried to roll off the tracks but an oncoming street car crushed his right foot. The evidence further showed that the street car was not equipped with fenders or sand and that if the car had had such equipment the motorman would have been able to stop the car in time to avoid the accident.

During the trial the defendants called the physician who treated the plaintiff and asked him several questions regarding statements made by the plaintiff in regard to the accident. The plaintiff contended that any statements made by him to the physician were privileged communications but the defendants contended that the plaintiff testified to these facts on cross examination and therefore waived the privilege. The defendants further contended that some of the statements were made to the physician after the relation of physician and patient had ceased and therefore were not privileged.

In reviewing the case, the upper court held that any testimony given under cross examination is not voluntary and therefore not a waiver of a confidential communication between a patient and a physician, but that a communication made after the relation of physician and patient has ceased is not privileged. The lower court entered a judgment for the plaintiff and the upper court affirmed the judgment of the lower court.

J. A. CASTAGNINO.

**Time of Liability of Physicians and Surgeons.**

*Bowers vs. Santee (Ohio)* 124 N. E. R. p., 238.

Santee, the defendant, was called by the plaintiff, Bowers, December 29, 1913, to treat a fracture of the left leg just above the ankle. The physician set the bones and continued to treat the patient until May, 1914. In April, 1915, the plaintiff brought an action against the physician, alleging negligence and want of skill in the treatment of the fracture.

The physician contended that the action was barred by the statute of Ohio which provides that such an action must be begun within one year of the date of the injury of which complaint is made. The plaintiff contended that that statute did not come into effect until May, 1914, the date of the last treatment.

The lower court sustained the contention of the physician and entered judgment for him, but the upper court held that the injury complained of did not occur upon the date of the first visit of the physician but covered the entire period of treatment and that the statute did not become effective until the date of his last treatment. The judgment of the lower court was reversed and remanded.

J. A. CASTAGNINO.

# GYNECOLOGY

## UTERUS

**Royster, H. A.: Inguinal Hernia of the Uterus.**  
*South. M. J.*, 1920, xiii, 275.

Royster reports the case of a colored woman 45 years of age who gave the following history:

She had been married twice but had never been pregnant. Menstruation, which was established in her fifteenth year, occurred every twenty-eight days but had always been vicarious, the flow coming from the nose. During her fourteenth year of age a lump appeared in the left groin but gave rise to no symptoms and was therefore disregarded. Not until her forty-fourth year did this mass cause trouble. At that time it increased rapidly in size in a period of twelve months and its growth was associated with pain and discomfort.

Examination revealed a swelling in the left inguinal region the size of a man's fist—hard, tender, irreducible, and only slightly movable. The vagina was normal but no cervix presented. On bimanual palpation no internal pelvic organs could be made out.

Operation revealed a hernial sac containing a uterus somewhat larger than normal in which was a fibroid tumor the size of a billiard ball. The pedicle of the entire organ consisted of a well-developed left tube and ovary and the broad ligament, all of which were inside the sac. The specimen after removal showed complete absence of the right tube, ovary, and broad ligament.

The author follows this case report with a review of the literature, referring first to Cranwell's collection of 45 cases. In at least 32 of these the condition was congenital in origin. To this group Royster adds Oge's collection of 25 cases, Sutton's group of 5 cases, and 1 case each reported by Krug, Jopson, Parker, Upton, and Makkas. In Oge's group 2 of the herniæ were in the femoral ring, 1 in the obturator foramen, 3 at the umbilicus, and 19 in the inguinal region. Nearly all of the inguinal hysteroceles were on the left side, this being explained by Oge as due to the fact that the volume of the uterus was less on the left side and the uterus had descended early when the canal of Nuck was most widely open. Makkas pointed out the striking frequency in all forms of herniated uteri of associated malformations of the genitalia, chiefly the bicornate or bipartite uterus and often an associated vaginal atresia. The case reported by Makkas was that of a woman with a bilateral inguinal hernia, each hernial sac containing a small uterus. This frequency of associated genital malformations and hysterocele indicates an etiological connection between the two conditions.

CAREY CULBERTSON.

**Wilcox, D. G.: Supporting the Pelvic Floor to Prevent and Overcome Uterine Prolapse.**  
*Boston M. & S. J.*, 1920, clxxxii, 425.

The author considers only the prolapse which occurs at or near the menopause. This condition develops especially in two classes of women: (1) those who have had large families and who have worked very hard lifting heavy weights; and (2) those who are in better circumstances and take on weight as the menopause approaches. In order to appear well such patients increase the intra-abdominal pressure by wearing tight corsets and in this way the prolapse is produced.

Before prolapse is possible there must be a relaxation of the sacro-uterine ligaments and the levator ani in addition to a relaxation of the round and broad ligaments.

In the treatment the first step is the repairing of the perineum with special attention to the levator ani. The next step is a subtotal hysterectomy with removal of both ovaries and tubes, the ends of the ligatures on the round and broad ligaments being left long. The third step is the insertion of four chromic catgut sutures through the stump of the cervix. Into these sutures the stumps of the broad, the round, and the sacro-uterine ligaments are tied. The small raw surface remaining is covered with the flap of peritoneum dissected from the anterior wall of the uterus. If it is advisable to remove the cervix the six ligaments may be inserted into the vaginal vault in the same manner.

The author has performed this operation 156 times (63 panhysterectomies and 93 subtotal hysterectomies). The one death and two recurrences in the series were due apparently to the fact that the stumps of the ligaments had slipped out of the sutures in the cervical stump before healing had taken place.

S. A. CHALFANT.

**Pust, W.: Vaginal Shortening of the Round Ligaments with Vaginofixation** (Vaginale Baenderaffung mit Vaginofixur). *Arch. f. Gynaekol.*, 1920, cxii, 89.

Pust favors the vaginal operation for retroversion, but of course does not employ it for nulliparæ. He recommends a combination of the Menge-Dudley shortening of the round ligaments with intraperitoneal vaginofixation which he has used in 64 cases, the oldest dating back five years. Forty-one of these patients have been re-examined. Failure resulted in only 1 case. The value of these statistics is limited, however, on account of the recent date of some of the operations. The technique used was as follows:

Anterior colpotomy. Transverse opening of the plica. Elevation of the uterus with a thick, acutely



angled sound. Picking up of the round ligaments with the forceps about one-third of the distance from their origin. Suturing of the ends of the loops with two or three sutures which take up also some of the uterine muscle. Suture of the doubled ligaments with two or three sutures on each side. One to two sutures passed through the peritoneum, uterus, and peritoneum at the level of the internal os. One or two sutures passed through the vagina, the peritoneum, the uterus, the peritoneum, and the vagina.

The patient is allowed to sit up on the fifth day, frequently even earlier. She is discharged from the hospital on the tenth day. COLMERS (Z).

**Keiffer, H.: Lipolysis of Fibromyomata of the Human Uterus** (De la lipolyse des fibro-myomes de l'utérus de femme). *Rev. franç. de gynéc. et d'obst.*, 1919, xiv, 451.

Keiffer discusses the regression of fibromyomata of the uterus. He had occasion to perform a cæsarean operation and hysterectomy on a woman whose uterus showed a collection of fibromyomata of varying sizes and all degrees of development. A thorough histologic examination was made of the sections taken from the various nodules. This examination showed that lipolysis is one of the processes which brings about the regression and almost total, if not total, disappearance of such tumors. Associated factors are complicated tumefaction and hyaline, mucous, and other forms of degeneration. The lipolysis is most marked in the muscular fibers. The fibromyoma ultimately becomes a spongy tissue. The most interesting stage is that in which extremely delicate infiltrations of fat are seen in the colloidal state.

W. A. BRENNAN.

**Little, J. W.: The Rational Treatment of Carcinoma of the Uterus.** *Minnesota Med.*, 1920, iii, 159.

Little believes that in carcinoma of the body of the uterus a panhysterectomy should be done and followed by prophylactic radiation.

Cases of cervical carcinoma in the operable stage should be treated by a panhysterectomy followed by radiation or thorough radiation without operation. From experience and observation the author has come to the conclusion that the results obtained from radiation alone are as good as or better than those obtained from radiation and operation and with this method there is practically no danger or pain. Radium is able to penetrate where it is impossible to use the knife.

In inoperable cases the application of radium is much superior to any other treatment. When large fungating masses have caused toxæmia, they should be removed with the cautery and the area treated with radium.

Little has abandoned the Percy cautery for radium. He does not advocate the Wertheim operation because of its high primary mortality, its serious sequelæ such as vesical, ureteral, and rectal

fistulæ, and because the cures effected are too few to compensate for the difficulties and dangers of the method.

C. H. DAVIS.

#### ADNEXAL AND PERI-UTERINE CONDITIONS

**Rubin, I. C.: The Non-Operative Determination of the Patency of the Fallopian Tubes in Sterility: Intra-Uterine Inflation with Oxygen and the Production of an Artificial Pneumoperitoneum: Preliminary Report.** *J. Am. M. Ass.*, 1920, lxxiv, 1017.

In experiments on extirpated uteri with intact adnexa it was found that oxygen gas introduced through the cervix passed through the tubes and escaped through their fimbriated ends. The method was therefore applied clinically and 55 patients were examined in this way. If the tubes were open, the presence of the gas in the peritoneal cavity was readily detected with the X-ray. There were no bad effects. In some cases the result confirmed the clinical diagnosis of probably closed or patent tubes. In a number of cases the tubes were proved to be open when there had been reason to suspect that they were closed by the disease, while in others they were demonstrated to be occluded when there had been reason to believe them normal. The method had practically the value of an exploratory laparotomy. The two possible dangers, embolism and infection, are more theoretical than actual.

S. A. CHALFANT.

#### MISCELLANEOUS

**Block, F. B.: The Treatment of Acute Gonorrhœa in Females.** *Am. J. M. Sc.*, 1920, clix, 572.

A close relationship with undergraduate medical students for several years has convinced Block that there is something lacking in the present teaching of the subject of acute gonorrhœa. The general tendency of authors has been to skip over the acute stage of the disease and then dilate upon the chronic stage and its complications. This appears especially incongruous in view of the fact that careful observation and treatment during the acute stage may frequently prevent the ravages of pelvic inflammatory disease. It is a common experience for the gynecologist to cure cases of acute endocervicitis, but the physician in general practice is always skeptical about such a report. The object of this paper is to encourage more extensive instruction in the treatment of acute gonorrhœa in the female so that the practitioner may undertake the treatment of these cases with optimism as to the outcome even though he may not be successful in all cases.

#### ACUTE URETHRITIS

Acute urethritis, which is usually the first stage of acute gonorrhœa, is best treated by absolute rest without local treatment during the period of the acute purulent discharge. The average patient who is suffering from this condition, however, can-

not or will not remain in bed, so that it is usually necessary to treat her as an ambulatory case. At the dispensary of the University Hospital such patients are given two prescriptions, one for santal oil to be taken in 10-minim doses three times daily, and the other for a urinary sedative containing 5-minims of tincture of hyoscyamus and 10 gr. of sodium bromide to 1 dr. of the liquor of potassium citrate to be taken every three hours. The patient is instructed to drink water freely and return in a week. If at that time, the acute inflammation persists, the treatment is continued in the same manner.

In the course of two or three weeks a marked improvement will usually be noted, evidenced by freedom from symptoms and diminution or disappearance of the urethral discharge. It is at this time and not until then that local treatment should be instituted, and when it is begun, the patient should be warned that freedom from symptoms does not mean freedom from disease. Many agents have been tried in the local treatment of urethritis, but Block has come back to the use of silver preparations, either a 15 per cent solution of silver nucleinate or a 5 per cent solution of silver nitrate applied to the entire length of the urethra by means of a small cotton swab on a nasal applicator.

The patient should urinate just before the treatment and the urethra should be dried with a wisp of cotton on an applicator. This drying is important as it greatly increases the power of the gonococidal agent. The entire urethra should then be painted with the silver solution on another cotton swab, the applicator being inserted by a slow spiral movement until the bladder is reached. The applicator should then be withdrawn by the same spiral motion in the same direction, so that the cotton becomes tightened instead of loosened.

#### ACUTE ENDOCERVICITIS

In gonorrhœal endocervicitis not so rapid improvement following treatment can be expected as in urethritis. Nevertheless, conscientious and continued treatment will give results far above the expectations of the average practitioner. As soon as the presence of a gonorrhœal discharge from the cervix is determined hot douches of 1 : 8,000 potassium permanganate solution should be given four or five times daily. Block has found this solution to have the best cleansing effect in these cases. If

ordinary care is used, many of the objectionable features of permanganate can be obviated. The drug should be ordered in the form of 1-gr. tablets and these should be dissolved just before use. As soon as the discharge is well under control, ordinarily in about two weeks, local treatments to the cervical canal should be begun.

In applying any medicated solution to the cervical canal one of the most important points to be remembered is that the canal should be thoroughly cleansed and dried in order that the medication may come into actual contact with the infecting organisms in the cervical glands. Therefore, to obtain the best results, it has been the author's practice to expose the cervix by means of a bivalve speculum, wipe away the major portion of the discharge, and then thoroughly spray the cervix with an alkaline solution in order to dissolve the mucus. He then dries the cervix and passes an applicator soaked in an alkaline solution (liquor antisepticus alkalinus) into the canal as far as the internal os, moving it to and fro. After this he passes a dry cotton swab into the canal and removes the thin discharge. A 10 or 12.5 per cent solution of silver nitrate should be vigorously applied to the canal as far as the internal os and followed immediately by a similar application of tincture of iodine. These two drugs form a fresh silver iodide in the cervical canal as is evident from the characteristic yellow color produced.

Not infrequently the patient will complain of cramps in the lower abdomen when the tincture of iodine is applied. This is merely a uterine colic due to the stimulation of the muscle produced by the iodine fumes and need cause no alarm as it will disappear in a minute or two. Following this application, the cervix and cul-de-sac should be thoroughly dried and the speculum withdrawn. Only in very exceptional cases is the insertion of a tampon necessary.

The patient should continue the douches at home and report to the office for treatment two or three times a week for the first three weeks, after which time the condition is usually so greatly improved that the douches may be discontinued and the interval between treatments lengthened. When the discharge has lost its purulent character and has become scanty, smears should be taken. After three negative smears, one of which should be taken just after a menstrual period, the patient may be discharged.

C. H. DAVIS.



## OBSTETRICS

### PREGNANCY AND ITS COMPLICATIONS

**Davis, E. P.: Infection of Intestinal Origin Complicating Pregnancy, Labor, and the Puerperal State.** *Med. Rec.*, 1920, xcvi, 551.

The author groups the various infections of intestinal origin and contrasts them with puerperal septic infection of uterine origin. Special attention is given to the hygiene of pregnancy, the prevention of constipation by means of proper diet, the administration of refined petrolatum, and proper exercise, particularly walking.

Appendicitis is common during pregnancy and necessitates prompt surgical intervention. Cholecystitis, which so frequently occurs first during pregnancy, does not always require operation, but this possibility should always be considered.

Cases are cited to show the dangers of violent purgation during pregnancy and the possibility of trouble from the presence of hard fecal masses in the bowel at the time of labor.

Pyelitis during pregnancy is usually of bloodstream origin and in the author's experience occasionally requires drainage through the loin.

Appendicitis beginning during the late puerperium may be recognized by the absence of the ordinary local evidences of puerperal sepsis. It must be cared for promptly. General infection of the intestinal lymphatics may be due to excessive purgative and may occur also without such cause.

S. A. CHALFANT.

**Spencer, H. R.: The Lettsomian Lectures on Tumors Complicating Pregnancy, Labor, and the Puerperium. III.** *Lancet*, 1920, cxviii, 529.

In discussing cancer of the uterus complicating pregnancy, labor, and the puerperium, the author covers the etiology, diagnosis, prognosis, and treatment of the disease. He reviews also other published records of similar cases and describes in tabular form 10 cases which he observed in the University College Hospital. The after-histories of 3 cases previously reported by him are mentioned in order to bring the case records up to date. These 3 patients have been free from recurrence for twenty-five, twenty-two, and nineteen years respectively and 1 has subsequently borne a healthy child. All were subjected to a high amputation of the uterine cervix with the Paquelin cautery during the puerperium. In 2 other cases of cancer complicating labor a vaginal hysterectomy was performed during the puerperium. In these cases the cure has extended over a period of five years.

Of the author's 10 patients 7 were between 30 and 40 years of age. The youngest was 26 years old. Statistics show that cancer complicating pregnancy

reaches its maximum in persons less than 40 years of age while the maximum incidence of cancer not complicating pregnancy is reached after the fortieth year. In women less than 30 years old cancer occurs in the pregnant and non-pregnant in the ratio of 6:1. The youngest patient whose case was reported by Sarwey was 22 years of age.

The author's patients show the influence of child-bearing on the development of cancer. The patients in this series had had an average of 7 children and more than 8 pregnancies each. The part played by lacerations and erosions is not credited with any direct bearing on the condition, but venereal disease is considered to play a larger part than is generally believed.

The author urges the use of three methods of diagnosis: (1) digital pelvic examination, (2) inspection, and (3) microscopic examination. It seems impossible to find a proven case of carcinoma of the fundus complicating pregnancy. In cases of cancer of the cervix during pregnancy pain may develop early as the result of uterine contraction or sepsis. Attention is called to the atypical picture presented by one case in which small pockets of pus were found, the growth did not break down on examination, and no bleeding or increase in the size of the growth was noted while the patient was under observation. In this instance a microscopic examination was not made at the time.

The prognosis is grave in cases of cancer complicating labor. Obstruction, hæmorrhage, discharge, and infection tend to prevent impregnation or lead to premature labor with an associated high fetal and maternal mortality. Pregnancy does not appear to increase the tumor's rate of growth.

The results of operative treatment are not encouraging. Wertheim has obtained the best results. Four of his patients remained well for five years, 1 died from embolism, and 1 had a recurrence. The author does not consider Sarwey's list of 1908 sufficiently inclusive to be representative of the mortality following the Wertheim operation.

The treatment of cancer of the cervix depends on the operability of the condition and the viability of the child. If the condition is considered inoperable pregnancy should be allowed to reach its full term and then a Porro operation with the serrenœud should be performed. In advanced pregnancy operable cases should be treated by cesarean section followed by extended abdominal hysterectomy or by high amputation of the cervix during the puerperium following normal delivery or cesarean section. In postpartum cases radium treatment may give favorable results.

Five of the 7 cases in which treatment resulted in a favorable issue were operated on after delivery. The

author is not able to find the record of a case of cancer of the cervix in which a successful outcome followed vaginal cæsar an section. He believes that in the future less extensive operative measures followed by radium and X-ray treatment will lower the mortality. He attributes his own good results to the use of the cautery, antiseptic douches, and the fact that the tissues were in the process of involution when the operation was performed. J. W. ROSS.

**Goodman, H.: The Wassermann Reaction and Miscarriages.** *Surg., Gynec. & Obst.*, 1920, xxx, 368.

The author found that among 1,320 pregnant women, 87 per cent gave a negative Wassermann reaction. Only 6.7 per cent gave a 4 plus reaction. Of the multiparæ who had a negative Wassermann, 37 per cent had had one or more miscarriages as compared with 52 per cent of the multiparæ with a 4 plus Wassermann.

Only one woman among the 1,320 gave a history of syphilitic infection although approximately one out of every eleven had a strongly positive Wassermann reaction.

It is very probable that in every instance the husband was responsible for the disease of the wife. In spite of such facts as these there are still hospitals throughout the land which refuse to admit men suffering with syphilis. EDWARD L. CORNELL.

#### LABOR AND ITS COMPLICATIONS

**Demelin, L.: The Inferior Segment and "Contracture" of the Gravid and Parturient Uterus** (Le segment inférieur et la "contracture" de l'utérus gravide et parturient). *Rev. franc. de gynéc. et d'obst.*, 1920, xv, 1.

Demelin discusses the so-called "contraction ring" or Bandl's ring of the uterus. In the first part of the article he deals with the anatomical character of the different portions of the uterus. At the time of normal delivery the uterus is divided into two distinct parts. One of these is characterized by a thick, resistant, and firm wall terminating abruptly at the "ring," and the other, below it, by a thin and lax wall. Some authors believe this lower portion includes both the lower segment of the uterus and the cervix. In Demelin's opinion, however, it normally includes only the cervix. The abrupt ending of the thick portion of the uterine wall usually represents the sphincter of the internal uterine orifice, but in pathologic conditions the distention, thinning, or even rupture may involve part of the corpus so that it is then formed of a "ring" of some higher portion of the uterine corpus more or less distinct from the internal os. In such cases not only the neck but also a more or less extensive part of the body of the uterus may be compressed.

The sum of Demelin's reasoning is that the inferior segment is a part of the uterus during both pregnancy and labor, the only difference being that during labor it becomes cylindrical whereas it was spherical before.

The second part of Demelin's article is devoted to a discussion of rigidity of the pregnant and parturient uterus. This is due to muscular hypertony and may be local or annular or involve the uterus as a whole. The author reviews the clinical etiology (lack of synchronization of muscular movements which is often favored by an anomaly in the direction of the uterine contractile forces), the symptoms and clinical forms (abnormal local or general uterine tension), and the complications (slowness of labor and rupture of the uterine wall).

Although laparotomy has been done in such cases it is rarely indicated. Because of the slowness of the labor and the necessary manipulations the parturient woman is usually infected and the foetus dead or dying. Under such circumstances a hysterectomy, the usual complement of cæsaean section, is usually dangerous. W. A. BRENNAN.

**Coburn, R. C.: Anæsthetics in Obstetrics with Special Reference to Nitrous Oxide.** *Med. Rec.*, 1920, xcvi, 356.

Ether or chloroform when given in doses sufficiently large to relieve pain seriously delay the progress of labor, and if given over as long a period of time as is necessary in an obstetrical case, are decidedly toxic and lower the patient's resistance to infection. Nitrous oxide is especially adapted to obstetrical conditions because it induces analgesia quickly and is quickly eliminated.

The nitrous oxide is given as soon as the uterine contractions cause severe pain. In primiparæ, this is usually when a "four-finger dilatation" has been reached and in primiparæ, a little later. The patient takes from three to six inhalations of the gas at the beginning of the uterine contraction and is then instructed to hold her breath and bear down. This co-operation on the part of the patient materially shortens the labor and conserves her strength, thus promoting a more rapid convalescence.

While ether and chloroform have a deterrent effect on spontaneous respiration in the child, nitrous oxide has no such harmful effect. Briefly summarized, the advantages of nitrous analgesia are that it relieves pain, conserves vitality, has no toxic effect on the already overburdened organs of elimination, shortens the period of labor, does not lower resistance, shortens convalescence, and does not affect the spontaneous respiration of the infant.

S. A. CHALFANT.

#### PUERPERIUM AND ITS COMPLICATIONS

**Evans, W. G.: Total Inversion of the Parturient Uterus.** *Lancet*, 1920, cxcviii, 713.

Following delivery in the case reported by the author there was a brief hæmorrhage after which complete extrusion of the uterus and tubes was discovered. Evans promptly inverted the uterus by applying firm pressure upward. On passing his hand into the uterus to determine whether or not inversion was complete he found a tumor the size of a



small apple. On supporting the fundus with the left hand and pressing his knuckles against the tumor, the uterus spread out at once. There was no shock and no further hæmorrhage.

In the author's opinion the absence of serious symptoms was due to his promptness in relieving the condition.

A. J. SCHOLL, JR.

**Hart, D. B.: The Causes of Persistence of Puerperal Septicæmia.** *Edinburgh M. J.*, 1920, n.s. xxiv, 216.

The maternal mortality from puerperal septicæmia in Great Britain and Ireland still ranges from a little above to a little below 1 per cent. In the Vienna First Obstetrical Clinic, under the direction of von Boer, it is 0.84 per cent.

Hart gives statistics from the investigation by Newsholme and Bonney which show that from 1911 to 1914 the mortality per 1,000 in England was 1.39; in Wales 1.67; in Scotland, 1.34; in Ireland, 2.01. This rate is less than that from 1881 to 1890, but there is still much loss of maternal life. In Scotland 37 per cent of the deaths were due to sepsis.

The chief factors which will decrease maternal mortality are:

1. Aseptic and antiseptic management of labor. Internal examination should be minimized. Sterilized rubber gloves, a sterilized gown, and aseptic bed-sheets are necessary. Instruments should be boiled.

2. More intelligent management of the passage of the head and shoulders over the perineum. Frozen sections and casts, chiefly those of Braune, Barbour, Schroeder and Stratz, should be studied. These show that Nægele's flexion is not present during labor; there is really deflexion. Perineal laceration should be prevented.

3. Better management of the third stage of labor. The author describes his own method and discusses the waiting method of Clark, Harvie (1767) and the Dublin School as well as the methods of the Crédé period, 1853-1860. The mechanism of the separation and expulsion of the placenta and membranes as shown by a clinical study of casts and sections and postmortem specimens is described.

Nægele's theory of the mechanism of labor is accepted. There is usually flexion throughout labor, but casts and sections show deflection beginning even in the first stage. The physician should bear this fact in mind and keep the perineum supported until the occiput gets under the pubic arch. The presence of the arms between the chin and the sternum is a factor in deflexion. The fundus uteri does not descend during labor, but the foetus is elongated and the arms lie between the chin and the sternum, preventing flexion. Finally liquor amnii passes up between the breech and fundus. Normal mechanism at crowning and emergence requires guarding, especially in the cases of rigid and elderly primiparæ.

The author describes also the mechanism of separation of the membranes and placenta. Two stages must be recognized, viz., separation and

expulsion; separation of the membranes in the lower uterine segment; separation of the placenta when in part prævia. After the pains the placental site expands and if the non-following placenta does not respond to this very slight increase separation takes place in the spongy layer. The author's method in the third stage of labor is as follows:

The body of the uterus is grasped to prevent bleeding; the separation of the placenta is awaited; the diminution in the size of the uterus, the indications, separation, and downward expulsion of the placenta and membranes are noted; time is allowed for the final separation of the membranes; and, if necessary, expulsion is then effected by means of pressure in the axis of the brim.

Hart draws the following conclusions:

1. A return must be made to the old waiting policy.

2. The Crédé method of separating the placenta has been followed almost universally, but should be abandoned.

3. The statement that retention of bits of membrane does no harm and that antiseptic management will prevent mischief, is dangerously fallacious.

4. A maximum of three-quarters of an hour or an hour must be allowed for the third stage of labor.

5. The placenta and membranes should be carefully inspected after labor.

C. H. DAVIS.

#### NEW-BORN

**Rodda, F. C.: Studies with a New Method for Determining the Coagulation Time of the Blood in the New-Born.** *Am. J. Dis. Child.*, 1920, xix, 269.

A simple method for determining the coagulation time of the blood in the new-born which would require little special apparatus and could be used by any physician engaged in the care of the new-born was sought and the drop method was chosen. All factors such as the depth and site of the puncture, the size and sequence of the drop, the temperature, air currents, and the effect of foreign bodies in contact with the blood were considered. An effort was made to control and standardize all of these factors without complicating the procedure. The apparatus adopted comprises a spring lance or a simple lance, 2½ in. watch glasses, and No. 6 shot.

The glasses and shot are first cleaned with soap and water and then with alcohol and ether. The child's heel is sponged with ether and a puncture is made with the lance set at about 0.5 to produce a free flow of blood without pressure. The first drop of blood is discarded and the second caught on a clean glass containing the No. 6 shot. A second glass is inverted over the first. The watch glasses are gently tilted every thirty seconds until the shot no longer rolls but is embedded in the clot and the glass may be inverted without dislodging it. The end-result is sharply defined. At times, because the serum is forced out, the whole clot may move, carrying the shot with it. This is not confusing, however,



for if the clot is well-formed the shot will be found enmeshed in the fibrin and does not roll or rotate, while in a poorly-formed clot or one in which there is retraction it continues to roll.

An effort was made to check all sources of error. Watch glasses of the same size and curve were used in order to standardize the surface area of the drop in contact with the glass. The inverted glass minimizes the drying of the drop and prevents the entrance of dust and lint. The greatest source of error arises in the blood flow. A small, slowly-forming clot obtained by pressure clots very quickly. The depth and extent of the cut do not influence the clotting as long as the flow of blood is free and occurs without pressure.

The time was reckoned from the moment the first drop fell. The time consumed in the formation of the second clot was considered a part of the coagulation time. Determinations were made to the nearest half minute. No claim is made for absolute clotting time but the result gives at least a clean-cut relative time for comparative work. It is not regarded as of importance to determine whether the clot forms in six minutes or six minutes and forty-five seconds, but it is important to determine whether it forms in six or sixteen minutes.

The method described was checked with that of Lee and White with blood obtained from the superior longitudinal sinus of the same infants. The average time, which was the same by both methods, was seven minutes. The average coagulation time in the cases of 126 new-born infants in the first twenty-four hours of life was seven minutes, with an arithmetical deviation of one and one-half minutes. This gives an approximate range of from five and one-half to eight and one-half minutes. Eighty per cent of the determinations fell within this range and 95 per cent within a range of from four to ten minutes. It may be stated therefore that, as determined by the method described, the average coagulation time is seven minutes and a coagulation time of more than ten minutes represents delayed coagulation.

The bleeding time was determined also by Duke's method, a similarly weighted curve being constructed. The same general curve was obtained. The average clotting time in the same 126 cases was three and one-half minutes, with an average deviation of one and one-half minutes, or a range of from two to five minutes.

H. K. GIBSON.

**Creadick, A. N.: The Frequency and Significance of Omphalitis.** *Surg., Gynec. & Obst.*, 1920, xxx, 278.

An inflammatory exudate in the umbilical cord has previously been accepted as a manifestation of syphilis, but actually it has nothing to do with this disease. Omphalitis was present in 40 cases in which there was no evidence of syphilis, and absent in 29 cases in which syphilis was proved to be present. Both syphilis and omphalitis were present in 3 cases.

Generally the lesion consists of an extravasation of polymorphonuclear leucocytes into the wall of the umbilical vein; less commonly, into Whar-

ton's jelly, and occasionally into the walls of the arteries. Bacteria are associated with the lesion and evidently reach the umbilical cord from the placenta so that the initial pathologic process is a placental bacteriemia.

Cases of omphalitis are usually attended with fever during the course of labor and premature rupture of the membranes. Vaginal examinations during a prolonged labor favor the development of the condition. Omphalitis was observed in about 2 per cent of a series of 2,200 cases and was responsible for 14 foetal deaths. There were no maternal deaths in the series. The frequency of the infections and the resulting infant mortality may be reduced by substituting rectal examinations for vaginal examinations.

### MISCELLANEOUS

**Davis, E. P.: Prenatal Care from the Viewpoint of the Obstetrician.** *Therap. Gaz.*, 1920, xlv, 233.

It is in the toxæmia of pregnancy that the care of the mother during gestation is especially important. In the majority of cases of pregnancy toxæmia can be prevented by proper care. A physical examination should be given at regular intervals and should include a determination of the pulse tension, an examination of the heart, the circulation, and the urine. Often the blood should be examined also. A month under hospital care in the early portion of the pregnancy, or before the confinement, will often be found of the greatest value.

Pure food and water, care of women working in shops and factories, proper warmth in winter and escape from excessive heat in summer are all important factors. The prevention of toxæmia is far more difficult than its treatment. Additional hospital space is needed so that pregnant patients can be placed in separate wards where they will not be annoyed by confinement patients or infants and where they will have the best hygienic surroundings.

Septic foci developing during pregnancy shorten the lives of mother and infant. The colon bacillus, whether causing appendicitis, cholecystitis, or pyelitis, is a frequent menace. While the appendix should be removed during pregnancy as soon as the diagnosis of appendicitis is made, in cholecystitis and pyelitis during pregnancy surgical interference is rarely necessary. Care and attention to these conditions, however, are exceedingly important. Here again, hospital treatment is essential.

The recent war has yielded valuable information regarding the care of pregnant women working in factories. The current English and French literatures show that with good care the pregnant woman can do considerable muscular work, even indoors, without injury. While the need for such supervision is today not as it was during the period of the war, the subject demands intelligent study and the co-operation of medical, civic, state, and national authorities.



The interruption of pregnancy should always be considered a serious matter. In the interests of the fetus, pelvic deformity is no longer regarded as a justifiable cause for the induction of labor. The decision to sacrifice embryonic or foetal life in the interests of the mother is not to be made lightly. The obstetrician must be sure of his ground before taking this important step. If a fair chance be given to obstetrical science, this necessity will not arise very frequently.

In the interests of the public, much good can be accomplished by spreading accurate information among women concerning those conditions which most gravely threaten mother and child in pregnancy.

EDWARD L. CORNELL.

**McIlwraith, K. C.: Obstetrics and the State.**  
*Canadian M. Ass. J.*, 1920, x, 305.

In England and Wales in 1900 there were 4.65 maternal deaths per 1,000 living births and of these deaths 2.24 per 1,000 living births were due to sepsis (48 per cent of the total number). During the next ten years the rate steadily decreased until in 1910 the total maternal mortality amounted to 3.69 deaths per 1,000 living births and of these only 1.44 were due to sepsis (39 per cent of the total number). The figures given do not include deaths from puerperal nephritis. From 1911 to 1915 the rates on the same basis remained practically stationary, but including the deaths from nephritis, the total maternal mortality in this period was 4.2 deaths per 1,000 living births, and the deaths from sepsis, 33 per cent of the total number.

In the provisional registration area of the United States in 1910 the total maternal death rate was 6.5 deaths per 1,000 living births and the corresponding death rate from sepsis, 2.9 (44 per cent). In New York the total maternal mortality was 10 deaths per 1,000 living births, 5.7 of these being due to sepsis (over 50 per cent of the total number).

In Ontario during the years from 1908 to 1918 inclusive the figures furnished by the Registrar-General showed that the maternal mortality was 5.4 deaths per 1,000 living births and that sepsis was the cause of 1.88 deaths per 1,000 living births (35 per cent of the total number). In 1909 the number of

deaths due to sepsis amounted to 33 per cent and in 1918 to 31 per cent of the total maternal deaths.

When the death of a woman of child-bearing age is reported in England or Wales the Registrar-General sends the physician a confidential letter requiring him to state whether the death was in any way connected with childbirth. The replies to a long series of such letters resulted in the transference of nearly 8 per cent of the case records from the records of deaths due to general causes to those of deaths due to puerperal conditions.

In England and Wales the improvement in the death rate has been attributed to the enactment of two measures—the Midwives Bill and the Health Insurance Act which includes maternity benefits. The maternity benefit insurance is compulsory and covers all wage earners whose annual income falls below a certain sum. Unmarried women as well as the wives of workers are insured against the trials of maternity. The benefits consist of a cash bonus of thirty shillings and the provision of medical attendance. Rest for a period of six weeks is enforced and at least four of these weeks must be after the birth has taken place. Inasmuch as the rest is compulsory, it is deemed fair that when the insured is herself a worker she should be given as a benefit a fixed proportion of her weekly wage during that time. This is allowed in addition to the cash bonus. The Act was administered by co-operation with the local benefit societies and local government boards. More recently a Ministry of Health has been established which has sole charge of the administrative end of the work. The funds for insurance claims are provided by government contributions and a levy on the wages of the insured or her husband. In all countries in which any action has been taken along these lines, health insurance including maternity benefits clauses have been the objective.

In addition to the measures mentioned, maternity and child-welfare centers have been established and a campaign of education and help has been begun.

The chief causes responsible for puerperal deaths are meddlesome midwifery, injudicious and premature use of the forceps, lack of aseptic conditions, and ignorance on the part of the public regarding the real dangers of parturition.

C. H. DAVIS.

# GENITO-URINARY SURGERY

## ADRENAL, KIDNEY, AND URETER

McKinlay, C. A.: *Epithelial Hyperplasia in Congenital Cystic Kidneys*. *J. Urol.*, 1920, iv, 195.

A review of the literature shows that most authors regard congenital cystic kidneys as a malformation or new growth. Few have entertained the idea that "proliferation of the epithelial lining of the tubules, even attempts to form new, and possibly atypical tubules, may be evidence of compensatory effort by the healthy parenchyma of an organ whose efficiency has been handicapped by malformation."

The case cited to support this view was that of a man of 30 suffering from apoplexy. Autopsy revealed bilateral congenital cystic kidneys associated with cardiac hypertrophy, arteriosclerosis, and cerebral hæmorrhage. The microscopic study showed epithelial hyperplasia of the convoluted tubules with giant-cell formation dilatation of the tubules, papillomatous infoldings, and bud-like sprouts which were not unlike the pictures described in reports of cases of compensatory hyperplasia in the kidney.

FRANK HINMAN.

Jacobson, V. C.: *Pyelitis et Ureteritis et Cystitis Cystica*. *Bull. Johns Hopkins Hosp.*, 1920, xxxi, 122.

The term "ureteritis chronica cystica polyposa," was introduced by Litten in 1876. His patient was a man, aged 75 years, who had small, shrunken kidneys and a dilated right ureter which was studded with cysts and contained a calculus. The right kidney was hydronephrotic. Microscopically the walls of the ureter were thin and highly vascularized. The cysts contained many free nuclei and masses resembling giant cells with irregularly distributed bodies resembling nuclei.

Following Litten's contribution, over 50 cases of ureteritis cystica have been reported, the greater number by European pathologists, particularly French and German. The Germans have given the most complete descriptions, however, and have attempted to explain the pathogenesis of the condition. In the latter part of the nineteenth century the disease was more widely recognized. In 1902 Harris reported three cases from the Johns Hopkins pathological series. All three of the patients were aged persons and one was a woman. In 1907, Stow added a fourth case, and in 1909 Hibbs reported a fifth. Recently in doing routine autopsies at the Peter Bent Brigham Hospital the author discovered three cases in as many weeks. In this article he reports these three cases in great detail, giving autopsy and microscopic diagnoses. His study he summarizes as follows:

The condition described was a cystic inflammation of the pelvis, ureters, and bladder.

It occurred in persons of either sex and 95 per cent of the cases were those of senile, arteriosclerotic persons who had a history of urinary inflammation or other disturbance.

Two of the patients whose cases are reported in this article in detail had had prostatic trouble, and the third, bilateral pelvic calculi. One had a double ureter.

The pathogenesis of the condition is described as follows:

1. In the aged arteriosclerosis of the ureteral and vesical arteries is followed by muscular atrophy, fibrous myositis, and loss of elastic tissue which may lead to atony of the ureter and bladder.

2. By the marked infolding of the mucosa with fibroplasia in the tunica propria many cell nests of von Brunn are formed.

3. An inflammatory irritant, usually from the pelvis or bladder, causes the formation of granulation tissue which heals over apposed tips of mucosal folds and increases the number or nests. In young persons this is probably the only source of these cells.

4. The same irritant produces moderate proliferation of the isolated epithelial cells followed by central degeneration and fluid transudation, thus giving rise to microscopic and macroscopic cysts.

In view of the large number of cell nests of von Brunn in the ureter and bladder of senile persons and the high incidence of urinary tract infections in the aged, the author believes that cystic inflammation of the urinary tract is relatively common in this class of patients.

G. E. BEILBY.

## BLADDER, URETHRA, AND PENIS

Formiggini, B.: *A Contribution to the Histologic Study of the Mucosa in Extrophy of the Bladder* (Contributo allo studio istologico della mucosa vesicale extrofica). *Riforma med.*, 1920, xxxvi, 252.

The attention of surgeons has been directed almost entirely to devising satisfactory operative measures for the treatment of extrophy of the bladder. Little attention has been paid to the histologic peculiarities of the mucosa in this condition. The research which has been made has demonstrated principally cylindrical epithelial and calciform cells, tracts of mucosa somewhat similar to that of the intestines, and epidermal transformation of the epithelial cells of the mucosa.

The facts reported in most cases were such that the alterations in the mucosa might be attributed to external agencies and operative manipulations on patients not in their early infancy. In the histo-



logic examination made by the author of mucosa removed from an infant fifteen days old these factors were lacking as were the cylindrical cells and glandular formation mentioned by other investigators. Similar findings were made by Enderlen in 2 other cases of new-born infants.

Righetti stated that if the presence of mucous epithelium in the bladder was due to an anomaly of development of the cloaca, similar structures would be found in the rectum which is of similar origin. This was found to be true and was verified also in the author's case. Therefore Formiggini agrees with Righetti that the malformation occurs in the embryo at a very early period and is due to faulty development of the cloaca, the epithelium of which does not become differentiated but evolves according to the cylindrical and cubical types of cells alone.

W. A. BRENNAN.

**Bonn, H. K.: Hour-Glass Bladder, with Report of an Operated Case.** *J. Indiana State M. Ass.*, 1920, xiii, 107.

The author's case was that of a man 60 years of age who complained of frequency, straining on urination, and hæmaturia. These symptoms had persisted for five years. Examination showed 12 oz. of residual urine containing pus, blood, and albumin, but no casts. Rectal examination revealed enlargement of the prostate. Cystoscopy showed bilateral hypertrophy of the prostate and areas of acute and subacute cystitis. The cystoscopic examination was unsatisfactory on account of constant clouding of the medium in the bladder and was followed by complete retention.

Two weeks later a suprapubic cystotomy was done under local anaesthesia. Exploration of the bladder revealed a large upper cavity containing 20 oz. of urine which communicated with a smaller and lower compartment by a small, tight, round, ring-like opening which scarcely admitted the examining finger. This ring was 2 in. above the internal sphincter. The walls of the septum were continuous with the bladder wall. The lobes of the prostate were soft and about the size of a crab apple. The wound was closed with drainage into the lower cavity. Cystoscopy through the suprapubic wound failed to disclose the relation of the ureters to the septum posteriorly.

At the second operation, two weeks later, it was found that the prostate had greatly decreased in size. Prostatectomy was therefore not done, but the posterior urethra was dilated by the introduction of the index finger. The ring and septum were divided anteriorly and resutured in the opposite plane. It was then easily possible to introduce four fingers. The septum contained all the coats of the bladder.

The patient began voiding at the fifth week, and the suprapubic wound was closed at the end of nine weeks.

A supplementary note gives the results observed about eight months later. At that time the bladder capacity was 645 ccm. Cystoscopy showed the

original ring-like opening connecting the two cavities. Cystograms showed two cavities communicating by a large opening. The residual urine amounted to 240 ccm. The patient catheterized himself once every other day and was feeling better than he had felt in years.

The author briefly reviews the literature relating to diverticula of the bladder of which the hour-glass bladder is a variety.

H. A. FOWLER.

**Keene, F. E.: Circumscribed Pan-Mural Ulcerative Cystitis.** *Ann. Surg.*, 1920, lxxi, 479.

The author reports ten cases of "elusive ulcer" of the urinary bladder.

Although the condition is rare, Keene believes that many cases are overlooked because the earlier findings may vary only slightly from the normal.

Hunner's term "elusive ulcer" is unsatisfactory in that it gives no conception of the pathology. It is misleading also because it magnifies the importance of the ulcer which in reality is only a small portion and an end-result of an inflammation involving a considerable area of the bladder wall. Until recently the author spoke of the lesion as a "circumscribed parenchymatous ulcerative cystitis." Smith, however, suggested the substitution of the term "pan-mural" for the term "parenchymatous," and as this more nearly describes the pathology and the extent of the inflammation, it has been adopted also by Keene.

In the cases reported there was thickening of the entire bladder wall with oedema and minute superficial ulcerations of the mucosa. The disease usually involves the vertex of the bladder but its extent varies. In distribution it is not "patchy" but limited to one section which is generally firmer than normal. It also may extend outside the bladder.

The mucosa is thick and oedematous and stands out in sharp contrast to that of the normal bladder. The ulcers are superficial, single, or multiple, and present a clear, bright surface with sharply cut edges.

Microscopically the picture is that of an inflammation involving the entire bladder wall and paravesical tissues.

The cystoscopic picture is typical. The mucosa is oedematous and in color a diffuse dull pink.

The ulcers resemble healthy areas of granulation tissue and are always superficial. They vary in size from 1 by 2 mm. to 4 by 5 mm.

The symptoms in the cases observed by the author consisted of bladder pain and intense urgency and frequency of urination. The pain may radiate superficially down the leg or into the rectum. The symptoms are usually of long standing, the average duration being about four years.

The urine may be normal, but usually contains an excess of leucocytes and erythrocytes. A normal appearing urine with a few leucocytes and erythrocytes may be regarded as characteristic of the condition.



In the author's opinion the ulceration is due to a non-tuberculous infection but infections in the tonsils, teeth, and sinuses are not etiological factors. In some cases the urine is sterile. The clinical and pathologic findings suggest the possibility of a primary paracystitis, the changes found in the bladder being secondary.

After using local applications Keene has come to the conclusion that the only adequate treatment is complete excision of the inflamed area. The extent of the excision should be determined by the extent of the œdema rather than the extent of the ulceration.

In the cases reported the patients who were operated upon were cured and after varying lengths of time the capacity of the bladder became normal.

G. J. THOMAS.

**Ballenger, E. G., and Elder, O. F.: The Management of Tumors of the Urinary Bladder.** *South. M. J.*, 1920, xiii, 279.

In practical work with the new growths of the bladder there are three well-recognized groups: (1) benign papillomata; (2) malignant papillomata (which sometimes may appear benign when viewed with the cystoscope, but microscopically are malignant and unlike the benign growths, may fail to respond to the high frequency current); and (3) papillary carcinomata and sarcomata which infiltrate the bladder wall.

There is but one symptom which is sufficiently constant to be of any value in the diagnosis, viz., hæmaturia. If there is no readily assignable cause for hæmaturia, such as inflammatory processes, traumatism, or tuberculosis of the genito-urinary tract, the presence of a neoplasm is suggested, and if the patient is in middle life, the neoplasm is probably a papilloma. The amount of blood in the urine may not be in proportion to the size of the papilloma. The most profuse hæmorrhage from the bladder the authors have seen came from a benign papilloma not larger than a pea. The diagnosis of the neoplasm is confirmed when the growth is seen through the cystoscope.

If the patient is under 35, if the neoplasm conforms to the type recognized as a papilloma, if the base is apparently not infiltrated, if there are no nodules around its attachment to the bladder wall, if it exhibits no ulcerations or erosions, and if cystitis and incrustations are absent the neoplasm is probably a benign papilloma. The most important difference between the benign and the malignant tumor is the prompt response of the benign tumor to the high frequency current.

The exact status of radium in the treatment of bladder tumors is not yet definitely settled. Malignant papillomata may be treated either by fulguration or excision. Papillary carcinomata should be treated by cautery excision. In the differentiation between malignant and non-malignant growths the principal point is the infiltration of the bladder wall as determined by the cystogram.

The author emphasizes the importance of impressing the medical profession as well as the public with the fact that blood in the urine demands a cystoscopic examination. Cystoscopic examinations done early in such cases will undoubtedly save many lives.

V. D. LESPINASSE.

**Sieben, H.: Disturbance of the Bladder in Myelodysplasia** (Die Störung der Blasenfunktion bei Myelodysplasia). *Deutsche med. Wchnschr.*, 1920, xlii, 72.

The frequency of enuresis during the war has aroused a new interest in the question as to how often the trouble is of purely functional origin and how often it is due to organic lesions. In a series of cases the author has been able to determine that spina bifida occulta with the always associated myelodysplasia is a frequent cause. The diagnosis of spina bifida in these cases was made on the basis of a shallow depression in the region of the upper sacral vertebræ or the sacrococcygeal joint which continued downward as a band into the deeper structures.

These cases are differentiated symptomatically from the purely functional type by the fact that in the former enuresis occurs also during the day. This fact should always lead to further investigation. In purely functional disturbance the emptying of the bladder occurs automatically during sleep; the bladder empties itself when a certain degree of distention has been reached. During waking hours this is prevented by the action of the internal sphincter and the voluntary muscle which during sleep is excluded. In myelodysplasia, however, the center of bladder function in the sacral portion of the cord and in the conus terminalis is damaged and not sufficiently powerful to resist the desire to empty the bladder.

J. HERZFELD (Z).

**Colston, J. A. C.: Observations on Gunshot Wounds of the Urethra.** *J. Urol.*, 1920, iv, 185.

Colston reports three cases observed in a base hospital in France which illustrate the principles to be followed in the treatment of gunshot wounds of the urethra. Such wounds are invariably associated with injuries to adjacent structures and the immediate mortality depends largely on the extent of these complicating wounds. There is usually obstruction to urination and often a rapid extravasation of urine. On this account immediate attention is urgent, but unfortunately on the battlefield the wounded man is rarely operated upon within six hours of the receipt of his wound. French statistics show a mortality of 56 per cent for non-complicated bladder wounds. In fifteen cases in which both the bladder and intestines were injured, only one patient survived.

The most urgent requirement is deviation of the stream of urine from the injured area and therefore a suprapubic cystotomy should be performed immediately. At the same time an external urethrotomy should be done, the tract of the projectile



cleaned, and some attempt made at approximating the ruptured ends of the canal. It is rarely advisable, however, to attempt a plastic repair, as sutures almost invariably become infected. External urethrotomy alone should be done only in exceptional cases for although this operation is amply sufficient in cases of ruptured urethra seen in civil practice, gunshot wounds offer a different problem as there is danger of serious infection and adequate drainage must be obtained on account of the long journey which must be made to reach a base hospital.

FRANK HINMAN.

**Stern, M.: A Plastic Operation for the Cure of Urethral Strictures.** *Internat. J. Surg.*, 1920, xxxiii, 100.

The chief features of the plastic operation recommended by the author are: (1) isolation of the corpus spongiosum, including the bulb; (2) separation of the urethra from the urethral corpus spongiosum; (3) repair of the incision into the urethra with lateral suture to increase the size of the channel at the point where the stricture has been removed; (4) suturing of the structures over the urethra and the corpus spongiosum layer by layer; (5) suturing of the skin; and (6) the use of an indwelling catheter for several days.

V. D. LESPINASSE.

**Churchman, J. W.: Hypospadias, with Particular Reference to the Operation of Bucknall.** *Ann. Surg.*, 1920, lxxi, 486.

The author reports a case of penoscrotal hypospadias cured by the operation of Bucknall. In his opinion this operation has not received the attention its surgical soundness warrants. He regards operations for hypospadias as essentially problems in plastic surgery.

The article contains a description of the operative techniques devised by twelve different surgeons for the correction of hypospadias. Churchman is not sure of the percentages of successes which have attended these operations, but is of the opinion that occasional successes are more apt to be reported than repeated failures. After judging these operative procedures by the criteria of sound plastic surgery, he does not believe that any of them meet the test.

The well-established principles of plastic surgery, as outlined by the author, are as follows:

1. In every plastic operation there is the element of chance. The possibility of complete failure should always be taken into consideration and the question asked whether, in case this occurs, the patient will be worse off than before.

2. Plastic operations should be devised so that broad surfaces, rather than cut edges, are approximated.

3. Tension must be avoided at all stages.

4. The circulation of flaps must be reasonably preserved.

5. Flaps must be held in position without the use of elaborate retention dressings.

6. The repair of the actual defect should be done in one stage.

7. The purpose of a plastic operation is a permanent rather than a temporary result. Flaps should be devised therefore to allow for contracture and ultimate success should be planned for, even at the expense of neatness in the immediate result of the operation.

8. The probability of success in a plastic operation is always greatest, other things being equal, if infection is absent.

After a detailed criticism of the soundness of the surgical procedures so far devised for the cure of hypospadias, the author emphasizes the great superiority of the Bucknall operation. The steps of this procedure are as follows:

1. Correction of the curvature of the penis if indicated.

2. The plastic operation. The penis is laid back on the pubis. Traction sutures are inserted into each side of the foreskin of the penis and into the corners of the lower border of the scrotum. Two parallel incisions,  $\frac{1}{4}$  in. apart, are made on either side of the urethral opening and on the ventral surface of the penis and scrotum. These incisions extend from the head of the penis to near the lowest border of the scrotum. The ends of the incisions are prolonged outward at right angles for about  $\frac{1}{4}$  in. Two lateral flaps, thus outlined, are dissected outward, a small strip of skin,  $\frac{1}{4}$  in. wide being left in the middle of the penis and scrotum which contains the opening of the urethra. This strip will later become the roof and floor of the urethra.

After the flaps have been dissected the penis is flexed onto the scrotum with the hypospadias opening as a hinge. The lateral skin flaps are thus brought into flat approximation with each other like the leaves of a closed book. Mattress sutures are applied through the flaps and tied over small rubber tubes. Fine sutures are used and care is taken that they do not penetrate the new urethral tube. A No. 6 rubber catheter is stitched in place in the urethra and the penis is protected from the bed clothing by a chloroform mask suspended with a bandage from the waist. The catheter is allowed to remain in place for five days. Alternate stitches are removed the same day and the other stitches a few days later.

The second stage is undertaken not sooner than twenty-one days after the first operation or when healing is complete. Before the incisions are begun a catheter is introduced into the urethra to protect it from injury during the dissection. Two incisions are made, one on each side of the penis, beginning about two finger-breaths above and lateral to its root. The incisions are continued downward over the scrotum and parallel with the penis to a point a short distance below the head of the penis as it rests on its bed on the scrotum. The incisions are connected by an incision made at right angles to them and across the lower border of the scrotum. In this way a large square flap with its pedicle up-

ward is outlined. This flap is carefully dissected upward, care being taken not to injure the urethra.

The edges of the flap are sutured with interrupted sutures. They cover and form the under surface of the penis. The denuded portion of the scrotum is brought together with a few interrupted sutures.

The author concludes his article with the statement that the entirely sound operation of Bucknall should not be complicated by other attempts at cosmetics until the real purpose of the operation, the correction of the hypospadias, has been achieved.

G. J. THOMAS.

**Fagge, C. H.: Circumcision; Abstract of Clinical Lecture.** *Guy's Hosp. Gaz.*, Lond., 1920, xxxiv, 99.

On the basis of eighteen years' experience the author concludes that circumcision is not to be regarded as a minor operation entirely free from danger. In his opinion it is more serious than tonsillectomy. The operation should be done only under strict indications. Fagge claims that *per se* it is not important in the treatment or the prophylaxis of masturbation, enuresis, or venereal disease. Letters from various practitioners supporting this view are cited.

J. S. EISENSTAEDT.

#### GENITAL ORGANS

**Hoffmann, W. H.: The Venereal Granuloma** (Das venerische Granulom). *Muenchen. med. Wchnschr.*, 1920, lxvii, 159.

In 1896 a new granulating venereal tumor was described in Guyana. The infection is transmitted by sexual intercourse and occurs in whites as well as in blacks, but is only sporadic in the Tropics. It begins as a slightly itching pustule or papule on the skin of the penis or scrotum or the lesser labia. The length of the incubation period is not known. The nodule ulcerates and gives off a foul secretion in which the causal organism is found. The condition spreads by the formation of new papules or pustules near the edge of the ulcer. The granulations continue beneath the skin until gradually the inguinal region, perineum, and anal region become involved. If the mucosa of the rectum or vagina are attacked, stenosis of these parts may result. In the most severe cases the ulceration may invade the bladder or abdominal cavity. Characteristic of the condition is the fact that the inguinal glands do not become ulcerated although they may be inflamed and swollen.

In the typical case the venereal granuloma shows an ulcer with a sunken base, which has a foul odor and a cauliflower edge. The disease has a tendency to form central scarring, it may last from ten to twenty years, it causes no pain or other disturbances of the general health, it occasionally heals spontaneously, and only rarely causes death due to pyæmia or loss of secretions. Immunity apparently is not induced by an attack of the infection and so far no attempts have been made to induce artificial immunity against it.

Histologically the tumor resembles a rhinoscleroma with numerous plasma cells in the upper half of the cutis. The epidermis thins out over this granulating mass and finally the ulceration breaks through. There are no giant cells in the tumor.

The causal factor has been proved to be the "calymmato bacterium granulomatis," a capsulated, deeply staining bacillus resembling the scleroma bacillus and the Friedlander pneumobacillus. It is found in the secretion of the ulcer, more frequently in the plasma of the large mononucleated cells of the ulcer edge, in groups of 15 or 20. Injection into the peritoneal cavity of rabbits, guinea pigs, and rats of the bacilli grown upon media containing maltose causes death within from twenty-four to forty-eight hours but without the characteristic findings of the disease in man.

In the differential diagnosis only the malignant forms of soft chancre must be considered and the diagnosis can be made from the discovery of the causal bacillus and the improvement which follows treatment with pure carbolic acid. Mercury, iodides and salvarsan are of no value in this condition. Recently patients have been given injections of from 60 to 120 ccm. of a 1 per cent solution of antimony tartrate in normal salt solution every two, three, or four days. This solution is sterilized by cold filtration and is given intravenously. After from 8 to 15 injections the causal organisms usually disappear and healing occurs slowly with scar formation.

KEMPF (Z).

**Wishard, W. N., and Hamer, H. G.: Résumé of the Past Two Years' Prostatic Work.** *J. Indiana State M. Ass.*, 1920, xiii, 111.

This paper supplements the report on prostatic hypertrophy made by the authors two years ago. An improvement in the mortality statistics is attributed to the fact that patients seek relief earlier while their condition is still good; prolonged preliminary treatment is given when necessary; a careful study is made of the bodily functions; the operative procedure is adapted to the individual case; the anæsthetic is chosen judiciously; and the patient is given better postoperative care and nursing.

If the patient's condition is good the operation may be performed in one stage.

Hæmorrhage is controlled in any of several ways: by the use of gauze packing, suturing of the torn mucosa, ligation of bleeding points, implantation of fat, and pressure by means of a rubber bag, etc.

The results in 120 cases recently operated upon are analyzed. The majority of these patients were between 60 and 80 years old. Two were over 80 years; the oldest, 84 years. The chief symptoms were frequency, 63 cases; difficulty in voiding, 34 cases; incontinence or dribbling, 3 cases; acute retention, 1 case. The duration of the symptoms varied from one to more than twenty years. The amount of residual urine varied from less than 1 oz. to more than 30 oz. A catheter had been used in 48 cases.



The suprapubic operation was used in all instances and 87 of the operations were done in two stages. The interval between the first and second steps varied between ten days and four months. The average stay in the hospital was four and a half weeks. The minimum stay was seventeen days.

Of the 120 patients, 2 died in the hospital shortly after the operation: 1 on the seventeenth day from uræmia, the other from renal insufficiency on the thirteenth day. Four died since leaving the hospital, one each from scirrhus carcinoma, uræmia, bilateral pyonephrosis, and carcinoma. H. A. FOWLER.

**Rohleder: Organotherapy of Prostatism (Prostatic Hypertrophy and Atrophy)** (Organotherapie des Prostatismus; Prostatanhyper- und Atrophy). *Deutsche med. Wchnschr.*, 1920, xlv, 70.

As the specific secretion of the testicular connective tissue, its hormone, seemed to exert an effect upon the glandular tissue of the prostate. Rohleder has used the Henning spermin preparations (testogen and hormospermin) in cases of prostatic hypertrophy and atrophy. These preparations were of the most benefit in the early stages of the condition when there was retention of urine without residual urine. They were of some value also in the second stage, but of no value in the third stage. The results were only transitory, however, never permanent. Two case histories are given.

G. SCHMIDT (Z).

**Ochsner, A. J.: Prostatectomy.** *Surg. Clin. Chicago*, 1920, iv, 233.

The author describes a two-stage perineal prostatectomy.

First stage: Under ether anæsthesia a cystotomy is done, the bladder having been previously filled with a 1:4,000 potassium permanganate solution. The first incision is made 3 cm. in length directly above the pubic bone and the bladder is opened by a linear incision 1 cm. in length. A double drainage tube is placed in this opening and the wound packed with gauze. Drainage is continued for from one to three weeks.

Second stage: Under ether anæsthesia a grooved curved sound is passed into the bladder through the urethra and an incision reaching halfway between the anus and the tubercle of the ischium to point halfway between the anus and the scrotum is made. The sound is cut down upon and a blunt-pointed knife, ground to fit the groove, is passed into the bladder, cutting the urethra which is held close to the pubis to prevent injury to the scrotum. The sound is then withdrawn and the finger is passed through the wound and into the capsule of the prostate, the gland being separated at the cleavage line. The adhesions are cut and the two lobes loosened and withdrawn with Young's prostatic forceps passed through the wound. Supernumerary lobes are similarly removed. The bladder neck and the capsule are grasped in Allis forceps and a double drainage tube with perforations is passed

into the bladder. Gauze is packed into the capsule alongside the catheter to control bleeding. As the suprapubic tube still remains in place, clots do not interfere with drainage. The perineal tube and packs are removed on the second day and the suprapubic tube in one week. The patient is allowed to get up in from three to seven days and the urine is passed normally in from ten to twenty days.

The advantages of this operation are that it can be done in the same time as a suprapubic operation and through a smaller incision and gives rise to fewer adhesions. In young patients with mild obstruction and no bladder or kidney complications a perineal prostatectomy can be done without a cystotomy. The cystotomy is preferable to the use of a trocar and catheter as there is less chance that it will be followed by cellulitis. The operation can be done under spinal anæsthesia. FRANK HINMAN.

### MISCELLANEOUS

**Lick, M.: The Cystoscopic Diagnosis and Treatment of Certain Lesions of the Genito-Urinary Tract.** *Pennsylvania M. J.*, 1920, xxiii, 464.

The author cites the characteristic cystoscopic findings in cases of cystitis, pyelitis, calculi, and tuberculosis. He is enthusiastic regarding pelvic lavage in the treatment of pyelitis in pregnancy. The indigo-carmin test he regards as the best all-around test for the determination of renal function.

The deductions made by the author are the usual ones made in typical cases such as those reported. There is nothing new in the report as a whole and none of the cases are extraordinary.

J. S. EISENSTAEDT.

**Zerbino, V.: Purulent Affections of the Urinary Passages in Nursing Infants** (Afecciones purulentas de las vías urinarias en el lactante). *Rev. méd. de Uruguay*, 1920, xxiii, 19.

For a definite and accurate diagnosis of affections of the urinary passages in infants a systematic general examination is essential. To illustrate the necessity for such an examination the author gives in detail the histories of two cases in which the general symptoms of a rhinopharyngitis were present. These symptoms consisted of depression and irritability, high fever with remissions, yellowish ashen color of the skin, pallid mucous surfaces, thirst, a coated tongue, moderate diarrhoea, and vomiting. Physical examinations of the chest and gastro-intestinal tract were negative. There were no meningeal symptoms nor other manifestations of pathology to account for the clinical picture. The etiology of the condition would have escaped detection if an examination of the urine had not shown large numbers of pus cells. The symptoms common in older children in affections of the urinary tract—increased frequency, dysuria, opalescent urine with mucous threads, hypogastric and lumbar pain, and tenderness to palpation over the kidneys—are of no value in the cases of infants.

Certain signs of special value in infants are the pallid mucous surfaces and the ochre tint of the skin. This color is generalized but more manifest in the face, palms of the hands, and soles of the feet. It is an earthen or ashen tint. The mucous surfaces are pale because of anæmia with both oligocythæmia and oligochromæmia. This appearance is usually manifested at the end of the first two days.

Another valuable but inconstant sign is the infiltration of the face. The eyelids, cheeks, and lips may become moderately infiltrated and oedematous, especially in the morning. Irritability and sleeplessness are marked. Fever is often very high, oscillating between 38 and 40 degrees C., and may be associated with convulsions. In some cases fever is absent entirely but usually it is persistent, irregular, and remittent. Vomiting is frequent and generally follows nursing.

Urotropin, salol, hot baths, and vaccines are used in the treatment. Urotropin is given in large doses, as much as 40 to 70 gr. per day. Alkaline diuretics may be given to lower the acidity of the urine, although the antiseptic action of the urotropin depends on the acidity of the urine. Occasionally pyelitis resists any form of treatment, the exacerbations and remissions continuing for weeks. In such cases autogenous vaccines may be tried. The author cites a case which responded readily to this form of treatment after other means had failed.

W. R. MEEKER.

**Keyes, E. L.: Problems Concerning Urinary Calculi.**  
*Internat. J. Surg.*, 1920, xxxiii, 120.

Urate stones are found more frequently in the bladder and oxalates more often in the kidney. Both probably form in the kidney pelvis, but the rough oxalate stone is retained there, while the smooth urate stone may pass unnoticed to the

bladder. The passage of renal calculi through the ureter may be wholly without symptoms. Ureteral colic is comparable to the cramp in the leg of a swimmer and probably not helpful. Operation for ureteral stone is indicated when alarming symptoms develop, the stone does not progress, and the stone is more than 0.5 cm. in diameter. The shape of the calculus, however, rather than its size determines the rapidity of its passage down the ureter.

In operating on bilateral stones operate first on the kidney with the better function. This is usually the kidney giving painful symptoms. Impaction of the stone in the ureter may temporarily reduce its function below that of its fellow. In some cases it may be practicable to operate upon both kidneys at once. In emergency cases provide drainage, preferably by pyelotomy. In cases of anuria the drainage should always be bilateral. Search for the stones should be made later. Geraghty's formula of deficient kidney function is helpful.

In 239 cases studied bilateral renal calculi were found in 25 per cent and calculi in both bladder and kidney in 4 per cent. The kidneys passed all of the stones in only 28 per cent. In 10 per cent the stones were arrested in the bladder or urethra, more than one-third being retained in the kidney pelvis and less than one-third in the ureter. If the urinary tract is clear after the passage of the first calculus, subsequent stones forming in that kidney will probably pass. Stones may be present for a long lifetime without causing symptoms and if they have grown so large that nephrotomy is required their removal is dangerous. Single kidney is not a contra-indication to the removal of calculi.

In order to overcome infection due to stone it is important to massage the prostate, give urinary antiseptics, and provide proper drainage of the ureters and bladder.

V. D. LESPINASSE.



# SURGERY OF THE EYE AND EAR

## EYE

**Weeks, J. E., and Greenwood A.: Enucleation of the Eyeball and Its Substitute Operations.** *Surg., Gynec. & Obst.*, 1920, xxx, 410.

The absolute indications for enucleation according to Weeks are: (1) intra-ocular growth; (2) a greatly shrunken eyeball; and (3) threatened sympathetic inflammation of the other eye. In the technique of enucleation it is essential:

1. To retain all conjunctiva possible.
2. To dissect close to the sclera, removing no more extrabulbar tissue than is absolutely necessary.
3. When an intra-ocular tumor is present to remove at least 1 cm. of the optic nerve next to the eyeball; otherwise, to sever the optic nerve quite close to the eyeball.
4. In dividing the optic nerve to cut from the nasal side in order to avoid perforating the os planum of the ethmoid.

Substitute operations are done for the purpose of producing better cosmetic results. Such operations are many and consist of either the removal of the entire globe with the implantation of some substance into Tenon's capsule or the removal of a portion of the eyeball with or without implantation. Weeks mentions about twenty different operations.

Greenwood, in discussing the paper by Weeks, stated that he has used large hollow glass spheres 20 mm. in diameter which he securely implants in Tenon's capsule and over which he sews the muscles. There was only 1 case of extrusion in about 200 cases. When the operation is properly done the upper lid does not sink in.

T. D. ALLEN.

## EAR

**Jones, C. C.: Conservative Surgery of the Lateral Sinus.** *Ann. Otol., Rhinol. & Laryngol.*, 1919, xxviii, 1164.

From a study of the literature including 50 case reports, a summary of the answers to a questionnaire sent to 100 of the leading otologists of the country, and his own case reports, the author has drawn the following conclusions:

1. The mortality following sinus operations is as great when there is routine ligation of the jugular vein as when the ligation is reserved for the severe cases.
2. The sinus should always be exposed before ligation of the jugular.
3. Ligation and resection of the jugular vein in thrombosis of the lateral sinus is a valuable procedure, but should be used only in cases in which there is undoubted evidence of septicæmia or a thrombosis of the vein.

4. The sinus should be exposed in cases of mastoiditis in which the temperature is high.

5. In thrombosis of the lateral sinus with absence of positive signs of septicæmia or thrombosis of the jugular vein the thrombus should be removed and developments awaited before the jugular vein is ligated or resected.

6. Thrombosis of the lateral sinus complicating mastoiditis is comparatively frequent and every otologist should be able to treat it scientifically.

7. Thrombosis of the sinus is nature's way of ligating, and all that is necessary in the majority of such cases is to open the sinus and remove the thrombus.

8. Except in selected cases, the ligation of the jugular vein in thrombosis of the sinus is radical and unnecessary.

O. M. ROTT.

**Smurthwaite, H.: A Lesson of the War: Suppurative Middle-Ear Disease.** *Brit. M. J.*, 1920, i, 467

Of 5,000 patients treated during one year in the Ear, Nose, and Throat Department of the military hospital at Tidworth, 890 had chronic suppurating ear disease. The period of disability ranged from a few months to many years. The chief complaint was partial deafness which kept the patient from the firing line. Most of the men were anæmic from prolonged suppuration and had obtained no relief from local treatment.

Chronic suppurative ear conditions would be enormously reduced if early systematic prophylactic measures were instituted. Every fever hospital should have an otologist to treat acute ear conditions. The author cites the case of a patient who was a carrier of diphtheria bacilli; the organism was found in the aural discharge and the ear condition was the result of a diphtheritic throat.

The most favorable time at which to effect a permanent cure is during the earliest stages of the disease. During the first two months there is no marked fibrous change in the lining membrane of the middle ear and the hearing still remains unimpaired.

The pathology of acute middle-ear disease is similar to acute inflammation of the mucous membrane elsewhere in the body. The condition begins in the posterior nares with congestion and swelling, and then extends up the tube to the middle ear where serous fluid collects. Becoming septic, this causes the formation of an abscess. If the inflammation spreads so rapidly that the antrum and mastoid cells become involved before the drum ruptures, an acute mastoid abscess develops. It is therefore essential to incise the drum as soon as fluid in the middle ear produces definite bulging and shows no indication of subsiding. The patient

should be put to bed and given a brisk calomel purge. Nose and throat trouble should be cared for immediately. The gentle use of the Politzer bag will open the eustachean tube and force fluid out of the middle ear. Gentle suction may be used also to draw the fluid from the ear. A pledget of cotton wool soaked in flavine or 50 per cent rectified spirit may then be plugged in the canal up to the drum and should be changed every few hours. Ten per cent phenol in glycerin or chloroform dropped into the ear will give relief from pain. Hot fomentations and steam inhalations are also soothing.

Men with ear diseases are from 10 to 70 per cent less efficient in the labor world. The poorer classes take casual notice of suppurative ear disease unless it is associated with pain. If, by propaganda, the poor and working classes could be made to realize that a running ear may lead to deafness and if they could be induced to go to a physician for advice at the onset of the condition the efficiency of the nation as a whole would be greatly increased.

W. J. GREENFIELD.

**Davis, G. E.: Blood-Clot Dressing in Mastoidec-  
tomy: A Modified Technique Which Insures  
Primary Painless Healing without Deformity.  
Second Report.** *N. York State J. M.*, 1920, xx,  
38.

In this report Davis discusses: (1) the intimate anatomical relation between the tympanic cavity

and the mastoid antrum and the bearing of this relationship on the infection of the clot, (2) the impossibility of extirpating absolutely every particle of pathologic and infected tissue by any operative technique, and (3) the desirability of supplanting the operative or mechanical treatment by a chemical or antiseptic method so used that it would not impair the natural bactericidal properties of the tissues and blood clot.

To reduce the chances of infection of the blood clot from the tympanum, the author makes a free incision in the drum and then irrigates 3 per cent iodine solution into the canal through the aditus, tympanum, and drum. After the iodine solution warm alcohol is used and then normal saline solution.

In order to overcome any infection which may remain in the mastoid cavity, the cavity is packed with iodoform gauze and the wound sutured to the lower angle, just enough space being left for the projection of the gauze. In twenty-four hours the gauze is removed. The bleeding occasioned thereby fills the cavity. In three to four days after painting the wound with 3 per cent iodine solution the stitches are removed.

The author is convinced that wound cavities should never be packed, that antiseptics are not detrimental to the bactericidal properties of the blood clot, and that in most cases his technique will bring about primary healing.

O. M. RORT.



# SURGERY OF THE NOSE, THROAT, AND MOUTH

## NOSE

**Dupuy, H.:** The Maxillary Sinus in the Rôle of a Reservoir for Overlying Sinus Disease. *South. M. J.*, 1920, xiii, 287.

Dupuy considers every chronic maxillary sinus affection to be of the reservoir type until the reverse is proven. If after the antrum is washed, pus reappears in the middle meatus within two hours, the disease is in the fronto-ethmoidal sinuses. In the reservoir type of affection it must be determined whether the maxillary sinus is itself diseased, or simply a receptacle for the accumulation of pus. This may be determined by irrigating the sinus several times at intervals of forty-eight hours. The reappearance of pus at each irrigation is conclusive evidence of a genuine sinus infection.

In order that the method described may be of the greatest diagnostic value, proper drainage from the fronto-ethmoid region must have been established before it is used. To this end, a middle turbinectomy should be done, all bony projections in the hiatus, especially those formed by the uncinate process and bulba ethmoidalis, being pared off and polypoid masses resected. In fact, the removal of any and all structural hindrances is indicated. All this is necessary to make the line of least resistance for fluids in the hiatus away from, rather than toward, the maxillary sinus.

The author draws attention to the fact that often in cases of maxillary sinusitis associated with diseased teeth the sinusitis is the cause rather than the result of the dental infection. O. M. ROTT.

**Briggs, H. H.:** An Orbitopalatal Route of Transilluminating the Maxillary Sinus. *South. M. J.*, 1920, xiii, 284.

The orbitopalatal route of transilluminating the maxillary sinus described by the author is utilized in the following way: The patient, who is seated on a high stool, is requested to tilt the head backward, to close the eyes, and to open the mouth so as to bring the hard palate into view. The light is placed a few millimeters below the margin of the lower lid, pushed inward and pointed downward until the infra-orbital ridge is well passed. With the cheek retracted an area of pink will then be seen on that portion of the roof of the mouth and outer antral wall surrounding the molars which corresponds to the floor of the antrum.

The advantages of the method are as follows:

1. The route offers little resistance to the rays.
2. The light passes more nearly through the center of the antrum, through opposite instead of adjacent walls, and therefore through a greater extent of abnormal structures.

3. The exit of light is through the wall containing, or adjacent to, the pathologic condition. This is advantageous for the same reason that the roentgenologist places next to the plate the surface nearest the foreign body to be shown. O. M. ROTT.

**Smith, O. A.:** Primary Carcinoma of the Nasopharynx, with Report of a Case. *J. Missouri State M. Ass.*, 1920, xvii, 62.

Carcinoma of the nasopharynx usually begins in the vault or on the posterior wall. Extension may take place in one of three directions: (1) by the pharyngeal route; (2) by the nasal route; or (3) by the posterior or cranial route.

Visceral metastases are rarely produced but adenopathy is a very early symptom.

In the case reported by the author the mass was removed by means of a La Force adenotome and curette. In six weeks the growth reappeared, a large swelling developed under the angle of the jaw, and the cervical glands became greatly enlarged. Death occurred six months after the primary operation. There was never any evidence of metastasis to the abdomen. O. M. ROTT.

**Embleton, D.:** Sphenoidal Empyema and Epidemic Cerebrospinal Fever. *J. Royal Army M. Corps*, Lond., 1920, xxxiv, 236.

Evidence obtained largely in a series of 34 autopsies shows that an empyema of the sphenoidal sinus may be the determining factor in the onset of meningitis due to the meningococcus. In the 34 autopsies sphenoidal sinus empyema was found 32 times. The series embraced all the clinical types of the disease, the bodies being those of patients who died (1) in the acute attack; (2) in a recrudescence developing between the fifth and the twelfth days; (3) from hydrocephalus after partial recovery; (4) from a relapse months after the first onset.

A sphenoidal empyema is defined as a sphenoid sinus filled with pus or muco-pus and lined by a congested mucous membrane. Possibly because of the fact that local military cantonment conditions hindered prompt laboratory work, the meningococcus was found only 20 times in the sinus and 3 times in the sphenoid bone. However, in all but 1 of a previous series of 30 cases the type of meningococcus found in the cerebrospinal fluid was identical with that found in the nose of the same patient.

In the pathogenesis of epidemic cerebrospinal meningitis the nasopharynx is undoubtedly the site of the primary infection. Here the meningococcus has been demonstrated in carriers, in the incubation period, early in the acute attack, in meningococcus pneumonia, etc. The infection is spread from the nose. The carrier infection was

found with marked frequency but the development of meningitis was comparatively rare. Carriers and contacts always suffered from "colds" which were characterized at first by a profuse watery nasal discharge showing meningococci in pure culture. Later this discharge was less fluid and more sticky. Therefore nasal catarrh seemed the natural disease produced by this organism and meningitis developed only when some other factor was introduced. This other factor is not necessarily an increased virulence in the meningococci of a single type for two and three types have been found in the same epidemic.

Granting that sphenoidal empyema is a step in the development of meningitis, mixed infection does not necessarily precede the empyema for in some cases the empyema has shown the meningococcus in pure culture. If it is assumed from its frequent occurrence that sphenoidal sinus empyema determines the onset of meningitis, any causes leading to the inflammatory closure of the ostia may be accepted as determining factors. Such factors may be a mixed infection, a vigorous meningococcal infection in a susceptible individual, and local anatomical and pathologic peculiarities.

The probability that sphenoidal sinus empyema is the chief factor in producing meningitis is indicated by the fact that such an empyema was found in 32 of the 34 autopsies upon which Embleton's paper is based and the 2 bodies in which it was not found were those of patients who died long enough after the onset for the empyema to have cleared up. In the examination of carriers who had completely recovered no meningococci were found in the sinus. Forty-seven patients who were acutely attacked but had completely recovered showed no sphenoidal empyema. The condition was discovered, however, in each of a series of 5 patients operated upon for hydrocephalus.

If with early and vigorous serum treatment the sphenoidal sinus empyema disappears, recovery will probably follow; if the empyema persists, a relapse or hydrocephalus will result. The author does not favor drainage of the sinus during the acute stage as 3 patients died following such treatment.

There was no evidence in the series of autopsies reported to show that the meningococci pass from the nasal mucosa to the meninges by way of the cribriform plate of the ethmoid. Every cribriform plate was free from macroscopic signs of inflammation. The author considers infection by way of the pituitary body, perineural lymphatics, or middle ear as improbable. On the other hand there was evidence of direct spread through the sphenoid bone in 7 cases of the series and in 3 such cases the meningococcus was found. Other possible routes are the systemic lymphatics and the blood stream.

Demonstrating the relationship between persistent hydrocephalus and sphenoidal empyema was the fact that each of a series of 10 hydrocephalus cases showed the latter condition. As in 7 of the 10 cases

pus was found in the cerebrospinal fluid in the ventricles while the fluid from the lumbar cord was clear, there is apparently a close local connection between the hydrocephalus and the sphenoid source. The former develops from chronic infection about the foramina of Luschka and Magendie which appears also to involve the ventricles. The route of entrance is probably the blood stream.

The author summarizes the course of nasal meningococcus infection as follows:

1. Simple catarrh followed by recovery or chronic infection.

2. Vigorous nasal reaction and sphenoidal sinus empyema with possibly septicæmia and meningitis.

3. Disappearance of the empyema followed by cure of the infection or death.

4. If the empyema remains and is active, death is probable. If the empyema remains quiescent, there may be a recrudescence, a relapse, or a smoldering infection with hydrocephalus.

Operation on the sphenoidal empyema always increases the symptoms, even in patients who recover. Operation during the acute stage is dangerous.

J. D. Cook.

## THROAT

**Guthrie, D.: Syphilis of the Throat, Nose, and Ear; Its Diagnosis and Treatment.** *Practitioner*, 1920, civ, 131.

In the pharynx the most common lesion of syphilis is a mucus patch located on the tonsil, the faucial pillars, the tongue, and the inner aspect of the lips. Chancre also occurs and is characterized by cartilaginous induration which is felt on palpation with the gloved finger, involvement of only one tonsil, enlargement of the cervical glands, and the persistence of the lesion for several weeks.

Another syphilitic lesion in the pharynx is the gumma. This appears as a hard, purplish swelling which attacks the palate, the posterior pharyngeal wall, or less frequently, the tonsil. It soon breaks down at its center, becoming an ulcer with a greenish-yellow base, red indurated edges, and a "punched out" appearance which is often quite characteristic. The palate may be perforated and the soft palate and posterior pharyngeal wall may be bound together in a cicatricial mass.

The common lesion of nasal syphilis is the tertiary gumma usually found on the bony septum.

Laryngeal syphilis is usually of the tertiary type and takes the form of a diffuse infiltration.

The external and middle ear are rarely affected by syphilis. It is in the inner ear and its associated nerve elements that the disease is most destructive. About 5 per cent of syphilitics are affected in this region. The cochlear and vestibular branches may be attacked singly or together. A characteristic effect of cochlear involvement is shortening of bone conduction. Syphilis of the inner ear may occur at any stage of the disease. It is a neuro-recurrence due to the syphilitic virus.



In the treatment reliance must be placed chiefly on the general treatment with mercury, potassium iodide, and the arsenical preparations. Local treatment is essential but is subsidiary to general therapy.

After mentioning the various well-known mercury preparations, the author states that each case must be judged individually as there is no definite routine treatment for syphilis and every authority has his own favorite method. O. M. ROTT.

**Clendening, L.: The Cause of Abscess of the Lung after Tonsillectomy.** *J. Am. M. Ass.*, 1920, lxxiv, 941.

During the last few years the incidence of lung abscess following tonsillectomy has increased. After reviewing the most generally accepted theories regarding the etiology of this complication the author comes to the conclusion that the two most probable causes are: (1) the forcing of septic tissue into the lungs by motor-driven anaesthesia apparatus, and (2) some direct relation between the tonsil and the lung, probably through the lymphatics.

Among records of cases in which the anaesthesia was maintained by means of motor-driven apparatus Clendening found those of 3 cases of postoperative lung abscess and those of 2 cases of postoperative bronchopneumonia. While providing a good field for the operator, the motor-driven anaesthesia apparatus feeds the ether spray into the posterior pharynx under sufficiently high pressure to balloon out the posterior space and carry infected tissue past the glottis into the lung. Even when the head is low, material accumulates in this posterior space and the pressure from the machine, being continuous, inhibits coughing.

In proof of his second contention, that the direct path of infection from the tonsils to the lung is probably by way of the lymphatics, the author cites one case, that of a man whose excessive sputum and persistent cough disappeared after tonsillectomy, and a second case, one of Richardson's, in which lung abscess followed postoperative hæmorrhage and pharyngeal treatment. Moreover, the experiments of Grober with India ink seem to indicate the presence of this direct pathway and the tonsils have long been considered a primary focus in pulmonary tuberculosis. To prevent infection by this route the author warns against persistent effort to remove every particle of tonsil tissue and states that some method of controlling hæmorrhage other than packing the raw tonsillar fossa in the septic oral cavity would be of great value. J. D. COOK.

**New, G. B., and Clark, C. M.: Angiomata of the Larynx; Report of Three Cases.** *Ann. Otol., Rhinol. & Laryngol.*, 1919, xxviii, 1025.

The authors accept the usual histologic classification of angiomata: (1) hæmangiomata, either simple or cavernous; (2) lymphangiomata; and, added for clinical convenience, (3) pseudo-angiomata including the varices and lymphectases.

The rarity of the true vascular tumor is evident from the fact that from the first diagnosis, which was made by Fauvel in 1876, only 55 conclusively proved cases have been reported and in a series of 217 true laryngeal neoplasms studied by the authors at the Mayo Clinic there were only 3 angiomata.

Of the 55 vascular tumors reported 47 were hæmangiomata and 8 were lymphangiomata. The case records giving the age of the patient show that the incidence of the two types was about equal from the twentieth to the sixtieth year. The youngest patient was 10 weeks old, and the oldest, 62 years. The case records in which the patient's sex is given show that the ratio of males to females was about 2:1.

Although it is believed that laryngeal angiomata are congenital and do not increase after the tenth year of age, the onset of symptoms has been reported most often after the twentieth year. The late onset probably indicates some exciting cause. Hoarseness is usually the first complaint. This may be intermittent if the tumor is vascular or may gradually increase during a period of years to aphonia. In one of the cases reported the symptoms preceded the diagnosis by three weeks and in another by nine years. In some cases recurrent hæmorrhage is the first symptom. Its severity depends upon the coagulability of the blood and the degree of vascularization of the tumor. Dyspnoea and pain are comparatively rare.

When limited to the larynx, angiomata usually involve only the true and false cords. When associated with angiomata elsewhere a laryngeal tumor may be outside of the larynx or involve one or more structures within it. A true cavernous hæmangioma is always dark blue or purple, rarely pedunculated, and usually smooth. As a rule it has a broad base, yields to the probe on pressure, and does not pulsate. This type may be attached to one or more laryngeal structures. Simple or superficial angiomata, flattened and limited to the mucous and submucous structures, may involve nearly the whole larynx and part of the trachea.

As a rule they are purple; seldom red. Lymphangiomata which are pale or transparent are larger than hæmangiomata and more resistant to the probe. They may be smooth or papillary. Case reports indicate that lymphangiomata are single but a single tumor may be lobulated. Varices present themselves as tortuous clumps of vessels which often are pulsating and usually are a brighter red than angiomata. It is not easy to differentiate simple varices from simple hæmangiomata but the cavernous types are distinctive.

As it is difficult to obtain case histories from children and as microscopic examinations are manifestly impossible, most cases reported have been diagnosed from clinical examinations. These may err, but there is less chance of a mistake in cases of lymphangiomata than in cases of hæmangiomata. With the use of the laryngoscope, however, there is little difficulty in distinguishing true angiomata from laryngeal malignancies. Granting that angiomata

are congenital, they usually manifest themselves between the second and fifth decades of life. The onset may be sudden after an acute exanthema, or gradual and associated with inflammation of the upper respiratory passages. Other associated ills, of rare occurrence and unestablished interrelation, are anæmia, syphilis, and paralysis.

Pseudo-angiomata consist of enlargement or dilations of normal tissues or benign neoplasms. Simple angiomata consist of newly-formed capillary blood vessels with thin or thick walls surrounded by connective tissue. Cavernous angiomata consist almost entirely of newly-formed blood spaces of various shapes and sizes and contain many intercommunicating alveoli lined with endothelial tissue and surrounded by much fibrillar connective tissue and a small amount of smooth muscle. The blood in the alveoli remains normal. Lymphangiomata consist of newly-formed lymph spaces separated by varying amounts of connective tissue and sometimes in direct contact. They are lined with endothelium and contain a substance resembling true lymph.

The method of choice in the treatment of all laryngeal angiomata is suspension laryngoscopy and

the insertion of radium directly against the tumor. The author believes that radium is specific for all true vascular growths of the larynx as well as of other parts of the body. Pseudo-angiomata do not respond so well to radium, and if they are small and pedunculated should be removed with the laryngeal forceps. Small nodular tumors, either true angiomata or pseudo-angiomata, can often be satisfactorily treated by fulguration or the use of the electric cautery. Like other laryngeal tumors angiomata may require tracheotomy for the relief of dyspnoea. Intubation is to be avoided because of the danger of hæmorrhage. Radical operations, such as thyrotomy with or without cauterization, are to be employed only as a last resort to relieve distress or to remove large angiomata which may be the cause of hæmorrhage. In such cases thyrotomy offers the best exposure and the least danger.

The author gives the histories of three of his own cases. In 1 case thyrotomy and cauterization were done. In 2 others the use of radium resulted in improvement. Histories of some two dozen cases in which the diagnosis is doubtful are summarized from the literature.

J. D. Cook.



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## SURGERY OF THE NOSE, THROAT, AND MOUTH

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# INTERNATIONAL ABSTRACT OF SURGERY

SEPTEMBER, 1920

## ABSTRACTS OF CURRENT LITERATURE GENERAL SURGERY—SURGICAL TECHNIQUE

### OPERATIVE SURGERY AND TECHNIQUE

**Wight, J. S.:** A Clinical Study of Open Reduction Operations of Fractures of the Long Bones with Two New Bone Clamps. *Surg., Gynec. & Obst.*, 1920, xxx, 522.

The author advocates open reduction and retention of fractures of the long bones as a means of obtaining better functional as well as better anatomical results. No operation should be attempted, however, during acute disease or infection and chronic disease or infection should be given preliminary treatment. No case should be operated until the carbon dioxide combining power of the blood has been raised above 40 ccm. In cases of recent injuries the operation should be delayed about two weeks.

The author is impartial as to methods of fixation, using sutures, screws, Lane plates, and inlay grafts as indicated. A table of incisions for reaching various portions of each of the long bones is given. The clamps spoken of are not described but are shown in an illustration. One of them, a clamp with compound levers, is called an angular bone clamp. The other works on the toggle joint principle. Both should be powerful and efficient.

The results in 263 cases of various fractures of the long bones treated by operation are given in tabular form. Bony union was obtained in 262 cases. There was 1 death, a mortality of 0.45 per cent.

B. H. MOORE.

**Hewitt, H. M.:** The Preparation of the Skin for Surgical Operations. *Grace Hosp. Bull.*, Detroit, 1920, iv, 29.

In the sterilization of the skin two important factors are: (1) the patient's ability to resist infection, and (2) the relative value of the method and antiseptic used. Among factors of less importance which may be responsible for poor wound healing are syphilis and seasonal changes. Beckman found a larger percentage of infections in the colder

months than in summer and concluded that this was due to a decrease in the activity of the skin in the winter.

A method to obtain skin antisepsis must be simple and easy to apply. The antiseptic, preferably a solution, must be efficient, i.e., it must have the power to destroy the common skin organisms in a comparatively short time (not over three minutes) and should be sufficiently penetrating to keep the skin sterile during the operation. It must not macerate or injure the skin in any way. In laparotomies it must not injure the peritoneal coat of the intestine if it accidentally comes in contact with it. It should be applicable to all cases and standardized so that its antiseptic value may be known. It should not contain any proprietary preparation as the strength of such agents varies, they do not conform to any definite standard, and they cannot be depended upon.

A series of cases were selected for experimentation with several antiseptics, among which were McDonald's solution, 70 per cent alcohol, picric acid, tincture of iodine, and ether. In 100 cases of all varieties in which picric acid was used there were only 4 infections.

A. R. HOLLANDER.

**Babcock, W. W.:** The Immediate Sterilization and Closure of Chronic Infected Wounds: A New Method Applicable to Wounds of the Bones and Soft Tissues. *J. Am. M. Ass.*, 1920, lxxiv, 1301.

With the mass of the chronic infections of the war the aim of the Carrel-Dakin treatment—the early closure of the wound—has not been attained.

The author proposes a method of treatment which in his hands in about 350 cases in General Hospital No. 6, Fort McPherson, Georgia, proved very satisfactory. The treatment is applicable to chronic infected wounds of soft tissue and bone, especially in those parts of the body where, by means of a tourniquet, the solution can be prevented from entering the general circulation during and

for five minutes after the injection, and where large excisions can be carried out.

The wound area is prepared by daily shaving, washing with soap and water, the removal of all scabs and crusts, and the application of a 2 per cent yellow mercuric oxide in zinc oxide ointment for three days preceding the operation.

On the operating room table the skin is thoroughly scrubbed with a compound solution consisting of 2 parts cresol, 10 parts turpentine, and 88 parts gasoline, and the wound is painted with 3 per cent tincture of iodine solution. The region is then disinfected by injecting a saturated solution of zinc chloride under pressure into all the sinuses and cavities of the wound. Five minutes are allowed for the penetration of the zinc chloride and great care is taken that every recess is reached. The infected wound is then stained with an antiseptic solution of methylene blue of the following composition:

	Gm. or ccm.
Saturated alcoholic solution of methylene blue . . .	20
Caustic potash . . . . .	3
Phenol . . . . .	5
Ether to make . . . . .	100

After this solution has evaporated the surface will be stained a dark blue-black which may penetrate from 1 to 3 mm. Outside of this a much wider zone of avascular grayish-white tissue that has been sterilized and devitalized by the zinc chloride will be found.

The devitalized area is excised *en bloc* and the bone cavities, pockets, and holes are converted into clean, shallow, saucer-like defects. No zinc-infiltrated tract is left near a large blood vessel because of the danger of secondary hæmorrhage. The wound is closed without drainage.

The after-treatment consists in the application of copious dressings saturated with a solution of chloralhydrate, alcohol, and glycerine in a saturated solution of boric acid. These dressings are re-wet frequently and their application is continued until healing has occurred.

R. B. BETTMAN.

#### ASEPTIC AND ANTISEPTIC SURGERY

Seedorf, J.: *The Practicability of Employing Iodine for the Disinfection of the Skin.* *Acta chirurg. Scand.*, 1920, lii, 436.

None of the methods for disinfecting inanimate objects is applicable to the skin. Heat sufficient for disinfection cannot be used on the skin and mechanical disinfection has proven unsatisfactory and in some cases causes pain.

Between 1870 and 1880 iodine came into extensive use for skin disinfection and experiments were made to determine its efficacy. The results varied greatly with different investigators. The solvents most commonly used for the iodine are ethyl alcohol and benzine. These it was believed dissolved the fatty coating of the skin and thus made

it possible for the iodine to attack the bacteria beneath it. Some investigators, however, maintain that the skin should be dry when iodine is employed, and that when the application of the iodine is preceded by scrubbing with soap and water numerous bacteria are present.

The author tested the action of iodine in various solvents, water with KI, ethyl alcohol, propyl alcohol, benzine, and ether. The best results were obtained with 50 per cent propyl alcohol. Alcohol alone had no effect on spores but saturated iodine solution killed them in thirty minutes.

It was found that three paintings with a 1 per cent solution gave as good results as two applications of a solution between 4 and 10 per cent. The most effective method of removing spores is mechanical cleansing and in the author's opinion the ideal disinfectant is iodine used in conjunction with mechanical cleansing.

The preparation of the skin consists of the following steps:

1. A thorough brushing with soap and water, shaving, washing with a 70 per cent solution of ethyl alcohol, and sterile dressing.

2. One-half hour before operation, three paintings at intervals of five or ten minutes with 1 per cent iodine dissolved in 96 per cent ethyl alcohol 50 per cent propyl alcohol.

I. E. BISHKOW.

#### ANÆSTHESIA

Tilley, H., and others: *Discussion on Anæsthesia in Throat and Nose Operations.* *Proc. Roy. Soc. Med.*, Lond., 1920, xiii, Sect. Anæ. and Laryngol., 1.

In all branches of surgery the anæsthetic not only spares the patient pain, but by inducing an appropriate type and degree of anæsthesia materially contributes to the success of the operation. More especially is this the case in throat and nose surgery in which an active co-operation between the surgeon and anæsthetist and an understanding of the steps of each other's work are essential to the success of the operation and vital to the patient's safety.

Operations upon the nose and throat are not generally serious in themselves. Unfortunately, however, deaths during operation have not been infrequent in this branch of surgery, and have been due either entirely to the anæsthetic or to the entry of blood into the air passages.

It is a fact that death during operation under ether is very rare and death due to uncomplicated ether anæsthesia is practically unknown. The status lymphaticus does not appear in association with ether anæsthesia. In England during the last five years nearly 1,500 deaths during operation have been reported. While these statistics give no indication of the condition of the patient before the operation and therefore are of little value, it is a significant fact that in a very great proportion of the cases the anæsthetic used was chloroform or a mixture containing it.



Rood was indebted to Silk for reports of deaths under anæsthetics in the military hospitals. In two years and three months 121 patients died, 110 of the fatalities having occurred under anæsthesia induced with chloroform or a mixture containing it, and 11 under ether anæsthesia. Of the 11 patients who died under ether 9 were apparently dying of secondary hæmorrhage before the operation was begun. Each of the various Commands reported fatalities. The only Command with no death upon the table was the Irish Command which "would not even look at  $\text{CHCl}_3$ ."

The author reports 2 chloroform deaths. One patient died during the induction of anæsthesia for an adenoid operation and the other, a healthy child, from acidosis following narcosis for an X-ray photograph of a deformed foot.

If death occurs under ether it is justifiable to assume that the patient was either in extremis or that some technical difficulty arose which might have been foreseen. Furthermore, death does not occur from acidosis after ether.

Great improvement has been made in the method of giving ether, so that today every type and degree of anæsthesia which can be induced with chloroform can be obtained equally well with ether. The author contends that ether is the proper anæsthetic for operations upon the nose and throat. Any degree of anæsthesia can be produced and continued with ether alone.

The author describes his technique for inducing anæsthesia and discusses light and deep anæsthesia and the methods for preventing blood from passing into the pharynx and larynx.

In the discussion of Smithies' paper Tilley stated that in anæsthesia there are two points to consider. The first and most important is the patient's safety and the second the convenience of the surgeon. With regard to the first Tilley is of the opinion that no one will dispute the contention that ether is safer than chloroform or any mixture in which chloroform is an important constituent. He has seen 11 deaths under chloroform anæsthesia, 3 of them in his own practice. Two occurred before the operation had been begun. In each instance a comparatively trivial operation was to be performed and the patient was comparatively healthy. After an experience of this kind one turns to any method of anæsthesia which promises to eliminate such disasters.

The worst danger of chloroform is that one can never foretell when a calamity will happen. It is true that a little more oozing occurs during operations under ether, but it takes place when the surgeon is there to deal with it and while the anæsthetist is present. Under chloroform anæsthesia the blood pressure is lowered and there is very little bleeding, but later, when the blood pressures rises, some point which would have been evident if ether had been used, may begin to bleed. In the case of a child it may be necessary to induce anæsthesia again and perform practically a second operation.

Sir St. Clair Thompson reported 3 deaths and stated that according to his observations neither the operator's technique nor that of the anæsthetist seemed to account for the fatality. In the 3 cases the postmortem examination was made by an independent pathologist and status lymphaticus was found in all.

ISABELLA HERB.

**Rogers, J. B.: The Effect of Ether Anæsthesia and Subcutaneous Injections of Ether on the Circulating Leucocytes.** *Am. J. Surg.*, 1920, xxxiv, Anæs. Supp., 46.

Rogers found that there is a rise in the leucocyte count in dogs following ether anæsthesia or a subcutaneous injection of ether. The dogs were not operated upon but simply anæsthetized and therefore any change resulting must be attributed to the ether.

The relation between the polymorphonuclear leucocytes and the mononuclear cells varied but slightly. The average white cell count before anæsthesia was 12,711. Of these, 38.8 per cent were mononuclear and 61.2 per cent polynuclear cells. One half hour after the anæsthesia the average white count was 16,085. Forty per cent were mononuclears and 60 per cent polynuclears.

In rabbits the average count before anæsthesia was 11,875 cells, 46 per cent of which were mononuclear cells and 54 per cent polymorphonuclear cells. After anæsthesia there were 11,750 cells and of these 37 per cent were mononuclears and 53 per cent polymorphonuclears.

R. B. BETTMAN.

**Savignac, R., and Vidal, J.: Changes in the Rectal Mucosa following Narcosis by Intrarectal Etherization** (Alterations de la muqueuse du rectum à la suite de la narcose par éthérisation intrarectale). *Arch. de mal. de l'appar. digest.*, 1920, x, 428.

Intrarectal etherization causes a slight and temporary rectitis which disappears spontaneously within a few days.

The more serious changes which have been reported may be attributed to the use of a technique in which a high dosage of ether is employed or to the presence of a lesion of the rectum.

A patient who is believed to have a rectocolic affection should be subjected to intrarectal etherization only after a careful proctoscopic examination of the mucosa of the rectum and sigmoid.

W. A. BRENNAN.

**Griffiths, G. H. C. S.: Novocaine Anæsthesia; Some Disadvantages from a Surgical Standpoint.** *Lancet*, 1920, cxcviii, 960.

In the induction of local anæsthesia strict aseptic methods must be observed particularly in the preparation and administration of the solution. Perfect anæsthesia is obtained with a 0.5 per cent solution of novocaine with 5 minims of adrenalin to the ounce. Shortly before the operation the patient should be given a hypodermic injection of 1/150 gr. of scopolamin and 1/6 gr. of omnopon.

The infiltrated tissues which have been blanched by adrenalin distort the anatomical picture and often confuse the operator. Hæmorrhage varying from an extensive ecchymosis to a fair-sized hæmatoma is not uncommon. The vasoconstriction caused by the adrenalin is undoubtedly responsible for most of the local bleeding. The author advises that the adrenalin be withheld or that the hæmostasis be made more complete. Bleeding is more com-

mon in patients who are given novocaine without adrenalin than in those who have received a general anæsthetic. A serous discharge from the wound occurs in practically all cases.

Retention of urine is more common after local than after general anæsthesia and complications, such as coughs and bronchitis, following local anæsthesia are equal those following general anæsthesia.

A. J. SCHOLL, JR.

## SURGERY OF THE HEAD AND NECK

### HEAD

**Cathey, G. A.: The Surgical Treatment of Intracranial Pressure.** *Northwest Med.*, 1920, xix, 126.

Cathey makes a linear incision extending from the juncture of the middle and posterior thirds of the zygoma to the parietal crest. The skull is opened with a burr at the lower angle of the wound where the bone is thinnest. With rongeurs a large elliptical opening is made (Fig. 1). The dura is then cut so

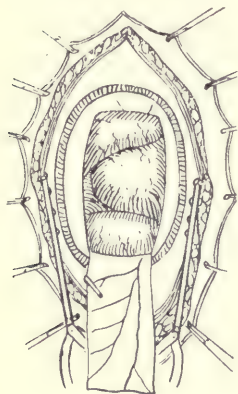


Fig. 1.

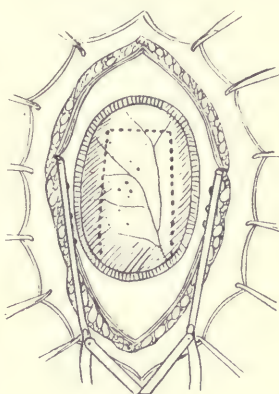


Fig. 2.

that a flap with its base downward (Fig. 2) is formed. This flap, which contains one of the branches of the middle meningeal artery, is then turned down and sewed in a tubular fashion around a grooved director (Fig. 3). The dural tube thus formed is forced into the substance of the temporal muscle beneath the zygoma and acts as a permanent drain. The remaining dura is cut in a stellate manner and the flaps turned out over the opening in the skull and stitched to the epicranium (Fig. 4, D, D<sup>1</sup>).

In this manner re-formation of the skull is prevented. Bone oozing is controlled with wax, and bleeding from the dura during the operation is checked with silver clips. The wound is closed around two gutta percha drains, one extending down between the dura and the base of the brain and the other between the muscle and fascia layers. These drains are removed after forty-eight hours.

The advantages of the operation are that it establishes permanent drainage and a permanent decompression.

R. B. BETTMAN.

**Symonds, C. P.: Cerebral Tumors and the Indications for Their Surgical Treatment.** *Guy's Hosp. Gaz.*, Lond., 1920, xxxiv, 154.

The clinical symptoms of cerebral tumors described in the text-books—viz., headache, vomiting, and optic neuritis—usually appear late in the course of the disease. They indicate an increase in intracranial pressure which may be due to a large mass within the cranial cavity or in such a position as mechanically to obstruct the outflow of cerebrospinal fluid. It is found that the operative mortality is much lower when the condition is diagnosed early and an operation is performed at once. An endeavor should be made, therefore, to determine the location of the tumor before the classical symptoms appear.

The indications for operative interference and the choice of the operation depend upon the site and type of the tumor. The early signs indicating the site are of greater value than the late signs as the latter are often masked by signs of increased intracranial pressure.

The two types of tumor most commonly found are gliomata and endotheliomata. The gliomata arise from the substance of the brain and vary greatly in their rate of growth. They grow more rapidly and are removed with greater difficulty than

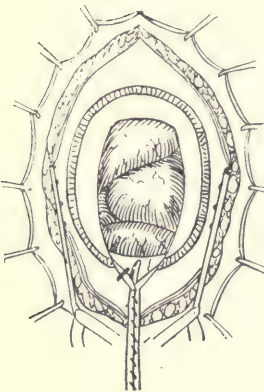


Fig. 3.

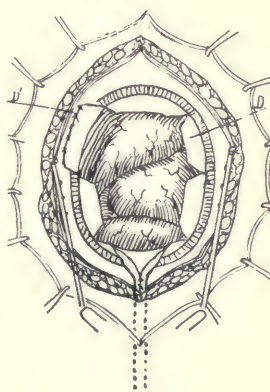


Fig. 4.



endotheliomata which, being of meningeal origin, are usually easily and successfully removed. Endotheliomata show but few signs of malignancy.

In attempting to determine the location of intracranial tumors attention should be given to the sensory changes, especially the sense of position, the ability to recognize objects by their size and shape, and the appreciation of differences in the intensity of pain and temperature stimuli. The localization of tumors in various specific areas of the brain is discussed in detail. G. S. FOULDS.

**Hanson, A. M.: A Report of Wounds Involving the Head and Spine Cared For at Evacuation Hospital No. 8, A. E. F. *Mil. Surgeon*, 1920, xlv, 414.**

The various injuries of the head and spine, the operations performed, and the mortality are summarized as follows:

	No.	Per cent
Scalp Wounds		
Scalp only.....	136	
Mortality.....		0
Skull Fractures with Intact Dura		
Operations.....	102	
Mortality.....		3.9
Cranio-cerebral, Sinus, and Craniosinus Injuries		
Cases.....	89	
Mortality.....		44.2
Spinal Injuries		
Bony spine only.....	12	
Deaths.....	0	
Injuries of Spine and Cord		
Cases.....	32	
Operations.....	24	
Operative deaths.....	15	
Operations		
Excision of scalp with exploration of skull.....	213	
Mortality.....		3.7
Trephinations of the skull.....	105	
Mortality.....		31.4
Decompressions.....	15	
Mortality.....		21.4
Laminectomies.....	18	
Mortality.....		72.2

In cases of depressed fractures and cases in which an opening had been made by a missile the skull was trephined after examination of the scalp and the wound swabbed with ethyl-alcohol. The surgeon's gloves and instruments were then changed and sterile towels were clipped to the edge of the wound. The patient was requested to cough in order to cause the extrusion of the pulped brain and bony fragments. After this a soft rubber catheter was passed through the dural opening to search for other pieces of bone, steel fragments, or bullets, and when these were located they were removed with an esquillectomy forceps. From time to time the track was irrigated with tenth-normal saline solution to remove débris and pulped brain tissue. As the catheter was removed a small quantity of ethyl alcohol was injected. The wound was then swabbed again and the scalp closed in two layers with interrupted sutures of No. 2 chromic gut. Small tears in

the sinuses were repaired with muscle graft and large tears with a portion of pericranium.

The author summarizes his conclusions as follows:

1. All injuries of the head should be operated upon under local anæsthesia and as early as possible.
2. Excision of the scalp and exploration of the skull should be done in all cases of scalp injury.
3. Foreign bodies should always be removed if possible, the scalp should be closed in two layers, and the patient should not be moved for six weeks if suffering from cerebral injuries.
4. Spinal injuries with severance of the cord should not be operated upon and a patient with such injuries should never be catheterized.
5. The high mortality in spinal cases is due to complicating abdominal and chest injuries.

LOUIS HANDELMAN.

**Bellin and Vernet: The Extraction of, and the Routes of Approach to, Foreign Bodies in the Pterygomaxillary Fossa and the Base of the Brain (Sur l'extraction et les voies d'abord des corps étrangers de la fosse ptérygo-maxillaire et de la base du crâne). *J. de chir.*, 1919-20, xv, 616.**

The authors report three cases in which a foreign body was extracted from the pterygomaxillary fossa, the retrostyloid region in front of the atlas, and the prevertebral region respectively. They have not been able to find any case recorded in the literature in which a foreign body was extracted from the pterygomaxillary fossa.

As ligation of the internal jugular at this level is almost impossible and as obliteration of the lateral sinus is not dangerous and suppresses the venous circulation in the internal jugular as far as the thyro-linguo-facial trunk, the latter would seem to be the best possible method of obtaining hæmostasis. It was not practiced, however, in the three cases reported, tampons only being used, with ligation of the internal carotid when necessary.

In two cases the foreign body was approached by the classical retrosternomastoid and the presternomastoid routes. In the case in which the projectile was in the pterygomaxillary fossa there were several possible routes of approach but the trans-sinusomaxillary route was chosen. By resecting the external part of the tuberosity of the maxilla (the infero-external wall of the sinus) the authors succeeded in extracting a large foreign body. The resection of the postero-superior wall of the sinus was the most extensive possible. The use of this route does not leave an ugly scar, the incision closing primarily or secondarily as in the Caldwell-Luc method. Drainage is obtained through the nose. The branches of the facial nerve are not affected.

W. A. BRENNAN.

**Towne, E. B., and Goethals, T. R.: Finger Exploration of Gunshot Wounds of the Brain. *Ann. Surg.*, 1920, lxxi, 531.**

An unselected series of 28 brain wounds in a forward hospital were treated upon the theory that the

problem involved was complete removal of contaminated brain, blood-clots, hair, cloth, bone, and metal so that primary suture might result in clean healing. The method adopted was to remove the brain and clot by suction and irrigation and then with fine forceps extract bone and metallic fragments detected (if the cavity was sufficiently large) by a gentle palpating finger. If necessary, the hole in the dura was enlarged. In some cases this finger technique, which was always preferred if possible, was contra-indicated by the small size of the tract in the brain substance or the awkward situations of the wounds caused by the passage of the missile through the deep nasal sinuses. In such cases the cleaning was done as well as possible with a catheter and forceps.

The entrance of a foreign body into the brain tissues causes irreparable damage to a more extensive area than that involved in the actual track of the foreign body, and this cavity is further broadened by hæmorrhage. Hence the size of the metallic fragment or the dural aperture is not a true index of the wider area of damage represented by the brain cavity.

If such a cavity is not over 7 cm. deep and is large enough to admit a finger, cleaning with the forceps under careful finger control gives absolute insurance against sepsis and only very rarely causes increased cerebral trauma.

The cleansing of such a cavity by Cushing's method of catheter palpation is sometimes not complete and therefore does not prevent sepsis. Cushing's method moreover requires a prolonged operation and is successful only in the hands of those who have had large experience. H. A. McKNIGHT.

**Harris, W.: A Clinical Lecture on Chronic Paroxysmal Trigeminal Neuralgia and Its Treatment.** *Brit. M. J.*, 1920, i, 693.

This paper is based on an analysis of the records of 312 cases of trifacial neuralgia seen by the author in a period of twelve years.

In the large majority of cases the disease was unilateral and affected chiefly the second and third divisions of the fifth nerve. In a small number of cases the supra-orbital branch was involved, but was seldom affected alone.

The pathology is somewhat obscure. No organic changes are discoverable in the nerve centers of the brain, the gasserian ganglion, or the main branches of the fifth nerve. However, in view of the fact that efficient interruption of the afferent sensations over the affected branches of the nerve gives instant relief, the author concludes that the neuralgia is caused by stimuli affecting the nerve endings at their periphery. The theory is advanced that such stimuli are due to a septic neuritis of dental nerve filaments, the result of caries, pyorrhœa, or periapical abscesses. It is pointed out that no other nerve is so liable to chronic infection of its branches. Such infection may persist in the filaments in the jaw long after the focus has been removed. A num-

ber of cases were observed in which the pain began immediately after dental operations or antral abscess.

In the series of 312 cases, 62 per cent of the patients were women and 38 per cent men. In instances of unilateral involvement the right side of the face was affected in 62 per cent of the cases and the left side in 38 per cent. It is not clear why the right side is more often affected than the left and no information is available as to the relative frequency of dental pathology on the two sides. Other causes of the condition mentioned are severe chilling of the face, emotional shock, and blows upon the face or jaw. In some cases the onset was apparently cryptogenic. Sometimes the initial attack was very sudden and severe, while in other instances its development was insidious and it increased in severity gradually.

The age of onset varied from 17 to 85 years. In 13 cases the condition began before the age of 30. The average age of onset in 205 cases was 50 years. A considerable interval often elapsed between the onset and a recurrent attack. Such intervals ranged from a few months to thirty years.

In 5 cases heredity was apparently a factor. Although severe chilling of the face may have preceded the onset, the patients experienced no special immunity during hot weather. Three patients were able to foretell an impending attack; the warning was described as a burning on the top of the head, constipation, a sensation as of swelling of the gums, and a shivering along the cheek. Such prodromal symptoms were observed from several days to a few minutes before the attack.

In the treatment of this condition little has been accomplished by drugs and the author now confines his treatment to two methods: (1) gasserectomy; (2) alcohol injection of the nerve trunks or the ganglion. The former is never attempted until alcohol injections have been tried. During the last ten years injections were made into the gasserian ganglion through the foramen ovale in 63 cases and in 31 of these the anæsthesia has remained total and there has been no recurrence of pain. When the ganglion is only partially infiltrated the third division will be totally anæsthetized but the anæsthesia of the first and second divisions passes off quickly and pain is apt to recur within a year. If the ganglion is totally destroyed keratitis is prevented by strapping the lids closed during the operation and flushing the conjunctival sac twice daily with boric acid solution.

In the cases of 25 patients with bilateral involvement injections have been given on both sides, either simultaneously or at different times. Bilateral extirpation of the ganglion cannot be done because the motor branches of the fifth nerves are destroyed and jaw-drop results. Bilateral injections of alcohol, however, can be given as the destruction is less complete and the motor fibers are regenerated.

Before the injection of alcohol is made the surgeon must be certain that the needle has reached



the nerve or ganglion accurately. If the needle is properly engaged, a few drops of 2 per cent novocaine will anesthetize the field of distribution of the nerve.

The author states that the results obtained by alcohol injections are very satisfactory. The relief from pain rarely lasts less than twelve months and in the majority of cases continues from two to three years. One patient has been free from symptoms for nine years after injections into the nerve only.

T. D. MOORE.

**Carter, W. W.: Humped, Hooked, and Bulbous Noses; Their Etiology and Treatment.** *Med. Rec.*, 1920, xcvii, 872.

The aquiline nose in its exaggerated form constitutes a deformity which may be corrected only by operation.

The traumatic variety of this deformity, frequently seen in football players, is caused by an overgrowth of cartilage and bone. The hereditary variety is due to upward growth of the nasal septum. By this upward growth the bridge of the nose is forced out, and, as a consequence, the tip sags downward and becomes hooked.

In the hereditary type a submucous resection will prevent the deformity if it is done at the right time. In two of the author's cases in which there was a family tendency toward a hooked nose a nose of this type has not developed following the resection.

In the traumatic type a more extensive operation in which parts of the nasal processes of the superior maxilla are removed is usually necessary. If the nose is too long, a fan-shaped piece removed from the septum will shorten it. After the operation the nasal cavities should be lightly packed with sterile vaseline gauze and a properly padded copper splint should be applied and left on for four or five days.

The author has operated upon 50 cases by these methods with most satisfactory results.

M. H. HOBART.

**Eby, J. D.: The Principles of Orthodontia in the Treatment of Maxillofacial Injuries.** *Internat. J. Orthodont. & Oral Surg.*, 1920, vi, 273.

The author describes a number of cases treated at the Walter Reed General Hospital at Washington, D. C., where the principles of orthodontia were applied in the treatment of injuries to the jaws and face. He gives two classifications of fractures of the mandible:

1. The French classification, according to which the mandible is divided into sections to which the depressing and elevating muscles are attached. This divides them into: (1) interdepressor, (2) pre-elevator; (3) interelevator; and (4) postelevator fractures.

2. A classification by which the mandible is divided anatomically. This classifies fractures into Classes 1, 2, and 3, or fractures through the symphysis, the body, and the ramus respectively.

In his description Eby uses the first classification mentioned and illustrates by roentgenograms and photographs fractures through the various regions

of the mandible and similar cases in which there was loss of substance at the site of the fracture in those regions. In the treatment of the latter group various methods of grafting were employed, such as the use of grafts taken from one stump and wired to the opposite stump, grafts taken from various parts of the body, such as the anterior superior spine of the crest of the ilium, osteoperiosteal grafts from the tibia, rib grafts, and an ox-bone graft.

LOUIS SCHULTZ.

**Waldron, C. W., and Risdon, E. F.: Mandibular Bone Grafts.** *Internat. J. Orthodont. & Oral Surg.*, 1920, vi, 319.

The authors advocate the use of mandibular bone grafts in cases of pseudarthrosis due to loss of bone with consequent separation of fragments. The operation should be delayed at least six months or more after the complete disappearance of all inflammatory phenomena. The bone grafts should include both periosteal and endosteal surfaces so that full advantage may be taken of their osteogenetic activity and osteoconductive properties. Dental splints with interlocking devices should be cemented to the teeth at least one week before the operation.

Rectal oil-ether anesthesia supplemented when necessary by ether administered intrapharyngeally should be employed. The ends of the fragments should be exposed and the periosteum elevated from their external, internal, and inferior surfaces for a distance of about 2 cm., care being taken to avoid perforation into the mouth cavity. The fragments must be trimmed back to bleeding healthy bone, a ledge being left above which will afford additional surface contact between them and the graft. This is best accomplished by the use of Friesner's mastoid rongeur forceps and Lane's gouge forceps. Holes should be drilled in the fragment and two short lengths of Belgian iron wire passed through them. A graft of suitable size may be cut from the tibia, a rib, or the iliac crest. Holes should be drilled in each end and the graft wired to the fragments. The authors prefer a graft obtained from the iliac crest. After the wound is closed the patient must be kept on a liquid diet for a few days. The splints should be left in position, keeping the mouth closed, for two months. If the posterior fragment is not controlled the mouth must be kept closed for three or four months. During this period, however, the splint pins may be removed from time to time and the mouth opened for examination.

LOUIS SCHULTZ.

**Butler, T. H.: The Ring Magnet.** *Arch. Ophthalm.*, 1920, xlix, 247.

The author describes the ring or Innenpolmagnet and its use, discussing also its several advantages over the Haab magnet. During the past three years the Mellinger ring magnet has come into more general use and in the British Empire is rapidly displacing the Haab type.

The ring magnet, so-called, is a scleroid or an apparatus for creating a magnetic field. The magnetic force at the center of the ring is expressed by the formula  $\frac{2 \pi n i^2}{10 r}$  in which  $n$ =the number of coils,  $i$ =the current in absolute units, and  $r$ =the radius of the coils. If a coil of soft iron is placed within the coil the magnetic field is greatly intensified.

The Haab type of magnet is apparently more powerful than the Mellinger, but the latter has the following advantages:

1. The operation can be performed when the patient is in the recumbent position.

2. The necessity for changing the patient from the sitting to the recumbent position after the foreign body has been brought into view is eliminated. During this manoeuvre, which is necessary in the Haab operation, the fragment often changes position and is lost to view.

3. There is no necessity for the use of a hand magnet.

4. The power of the magnet is concentrated at the center of the ring where the eye is placed.

5. The operation is performed upon a motionless patient with rods which admit of the most delicate manipulation, a far different proposition to manoeuvring the patient's head before a large magnet.

6. All operations are performed upon the open eye in an excellent light. When other magnets are used only side vision is possible.

7. The force used is under absolute control so that the most delicate and accurate procedures are possible.

W. F. MONCREIFF.

### NECK

**Frazier, C. H.: The Principles Underlying the Treatment of Toxic Goiter.** *Pennsylvania M. J.*, 1920, xxiii, 437.

Every patient with signs of incipient thyrotoxicosis should be subjected to an intensive examination in order that predisposing factors may be eliminated. Proper treatment of pyorrhœa, infected tonsils, or stasis may avert subsequent disease. Mental and physical therapy should be given to prevent fatigue. In the mildly toxic type of goiter developing during adolescence supervision as to the hours of work and sleep and restriction of studies may be all that is necessary. In the mildly toxic type of adenomatous goiter operation is a procedure of choice rather than of necessity. A grave toxicosis due to adenomata, however, necessitates resection eventually. In cases of beginning hyperplastic goiter there is great advantage in operation. In the degenerative, atrophic, or terminal stage of a hyperplasia there is no justification for the removal of the gland tissue.

In operations upon toxic goiters nitrous oxide is the anæsthetic of choice. In ligation the superior pole should be ligated as well as the superior thyroid artery. Ligation is of merely temporary value. If only one lobe is involved the total removal of the

lobe and the isthmus, and, in some cases, the ligation of the superior pole of the remaining lobe is the operation of choice. If both lobes are involved, a partial resection of both, leaving behind a strip of tissue in the posterior aspect of each, should be done.

M. H. KAHN.

**Honeij, J. A.: Cervical Ribs; with Presentation of Cases and a Bibliography.** *Surg., Gynec. & Obst.* 1920, xxx, 481.

According to Honeij, all the symptoms of cervical ribs may be present in the absence of cervical ribs, and in some cases in which cervical ribs are discovered no symptoms are presented.

In studying a group of cases presenting positive symptoms of cervical rib in the absence of cervical rib the author found large, irregular transverse processes of the seventh cervical vertebra and a very narrow space between this vertebra and the first thoracic rib. On the other hand, in certain cases of true cervical rib the costal space was so wide that pressure on the nerves and blood vessels was improbable and consequently could not give rise to symptoms. Cases with curvature of the spine and relatively insignificant pressure, transverse processes, or rudimentary ribs, however, may show very severe symptoms.

Keen classifies the symptoms as follows:

1. Local symptoms: tumor, pressure pain, etc.

2. Nervous symptoms (more frequent than vascular).

3. Vascular symptoms: pulsations, ischæmia, gangrene, œdema, thrombosis, aneurism.

4. Muscular symptoms: wasting, loss of power, easily induced fatigue, dysphagia, scoliosis.

Cases have been reported in which the symptoms resembled Pott's disease, Raynaud's disease, hyperthyroidism, or aneurism, and others in which there was a Klumpke-Déjerine paralysis. The reports of cases with various forms of neuritis are more numerous than those of cases with vascular disturbances. In many instances there are trophic and vasomotor affections. In others, muscular atrophy and sensory disturbances develop, while in still others there is atrophy of only the hand muscles. In two cases of cervical rib reported in the literature a history of hereditary syphilis was given.

Conditions in which the symptoms may be mistaken for those of cervical rib are:

1. Conditions resulting from disease or traumatism; pulmonary apical tuberculosis; callus formation from fracture of the first thoracic rib or clavicle.

2. Tumor growths: glands, aneurism, enlarged thyroid.

3. Scoliosis, unilateral compression.

4. Abnormalities of the first thoracic rib or clavicle.

5. Inflammatory conditions: transitory torticollis of the shoulder joint; occupational neuritis.

6. Exostosis of transverse processes; scalene attachment; localized myositis ossificans.



In some cases of cervical rib treated by operation dense postoperative scar-tissue formation has given rise to all the previous symptoms of cervical ribs and in some instances these symptoms are even more severe than before the operation.

Reports in which accidents are given as a cause of the symptoms of cervical rib are frequent in the literature. Muscular effort, bony compression, inflammation, and, in elderly persons, change in posture with forward or lateral bending of the vertebral column associated with tissue changes may all give rise to symptoms when either cervical ribs or enlarged transverse processes are present.

In most cases of cervical rib the symptoms develop between the ages of 20 and 30 years, but age is of little importance in diagnosing the condition unless the associated lesion and the cause of the symptoms are known.

Cervical ribs are found more commonly in females than in males, but there is a divergence of opinion as to the exact ratio.

The majority of authors are agreed that as a rule cervical ribs are bilateral. In Honeij's cases, however, the same changes were rarely seen on both sides. This fact and the fact that the symptoms are usually unilateral would seem to indicate that the general opinion is incorrect.

Keen states that a cervical rib is only an abnormal deviation of a normal portion of a vertebra. In the cervical, the lumbar, and even in the sacral region there is a representation of that which in the dorsal region is fully developed into a normal rib. It is well known that the variations in the last three thoracic ribs and the transverse processes of the lumbar region are greater than those in the cervical region. Therefore it has been thought that the law of compensation plays a part, so that, broadly speaking, when the twelfth thoracic ribs are absent seven cervical ribs are provided.

Tredgold believes that the formation of additional ribs is due to the persistence of a primitive type and that a decrease in the number of ribs is simply a stage in the progressive change which is seen to occur throughout the animal kingdom. A gradual but marked reduction takes place in the total number of ribs as we rise in the animal scale.

Gruber divides cervical ribs into four classes mainly according to size, and therefore growth, as follows:

Class 1. Those consisting of only a node which does not extend beyond the lateral dimensions of the transverse processes of the vertebrae.

Class 2. Blunt projections of bone 4 or 5 cm. in length.

Class 3. Ribs which extend far enough forward to articulate with the first rib or even to be attached to the sternum by a ligamentous band.

Class 4. Complete ribs having vertebral origin and costosternal cartilage.

In this article Honeij presents a series of cases which he divides into two classes: those which may be considered cases of true cervical ribs, articulating

like the thoracic ribs with the transverse processes, and those which may be considered cases of only rudimentary ribs. The first group includes 9 cases. In 1 case a positive diagnosis was made. In 3, there were no indications or symptoms of cervical rib even after the condition had been determined. In the remaining 5 cases the diagnosis had not been made although some of the symptoms were referred to the cervical region. In 3 of the cases a diagnosis of questionable pulmonary tuberculosis was made in addition. In 2 cases the question as to whether the rib was a rudimentary first thoracic rib was debated for some time.

Twelve cases belonged to the second group. Two are of especial interest. In 1, the rib was removed at operation. In view of later findings, it is not probable that the symptoms thought to be caused by pressure on the nerves by the seventh cervical ribs were due to the rudimentary processes. Malignant disease was found, the tumor mass being situated in the right axilla where it exerted pressure on the brachial plexus. Three patients gave a history of a tingling sensation in the left hand and numbness, but a diagnosis of cervical rib was not made or justified.

In 2 cases a cervical rib was suspected and in 1 of these the hands were cold and blue as far as the wrist and lacked sensation. The patient was 14 years of age and there was no history of trauma.

One patient, a man of 24, was injured while wrestling. An injury to the shoulder was suspected but radiological examination showed the joint to be within its normal limits.

In the last 5 cases of the series there were no symptoms, the condition being found on examination of the lungs in 4 cases and on examination of the vertebral column in the other.

Seventeen cases are reported in which the presence of cervical ribs was suspected as they presented more or less typical symptoms and histories. The radiological examination, however, did not reveal such a condition.

Another group of cases reported were 13 cases of thoracic rib anomalies. None of these patients had symptoms.

The author describes a specimen cervical rib which is in the osteological collection of the Yale School of Medicine. Its length is 9 cm., but the ventral 4.5 cm. are fused with the upper surface of the first rib, the fusion beginning 1 cm. anterior to the tuberosities. Although fusion is complete, except in the posterior centimeter, the body of the cervical rib is demarcated laterally by a slight groove running almost its entire length, and medially by a shallow groove 1 cm. in length at the ventral end. The body of the rib, which posteriorly is 7 mm. in thickness and 13 in breadth, tapers ventrally and reaches the posterior edge of the groove for the subclavian artery. On the upper surface an oblique groove, 2 cm. in length, runs forward from the tuberosity to the medial edge. The head of the rib begins 7 mm. laterally to that of the first rib and is

rounded. It shows a single articular facet which faces upward, backward, and medially, while that of the first rib faces somewhat downward. The head of the first rib apparently articulated with the centra of both the seventh cervical and the first thoracic vertebrae.

The neck is 3 cm. in length, somewhat rounded near the head but enlarging until near the tuberosity, it acquires a breadth of 15 mm. It lies 7 mm. above and parallel to the neck of the first rib which it resembles in shape, size, and appearance. The upper and lower surfaces are rough and porous.

The tuberosity of the cervical rib is larger and more knob-like and prominent than that of the first rib and projects more dorsolaterally. The articular facet, larger than that of the first rib, is slightly convex and triangular in outline, the apex being directed medially, and faces backward and medially as does that of the first rib.

In the author's opinion it is altogether probable that a cervical rib of this type would not produce motor, sensory, or vasomotor disturbances or interfere greatly with the apical expansion of the lung.

G. W. HOCHREIN.

## SURGERY OF THE CHEST

### CHEST WALL AND BREAST

**Delbet, P., and Girode, G.: The Treatment of Purulent Pleurisy by Closed Drainage and Continuous Aspiration** (Traitement des pleurésies purulentes par le drainage étanche et l'aspiration continue). *Rev. de chir.*, Par., 1920, lviii, 1.

The authors' treatment of non-tuberculous purulent pleurisy consists of three stages. In the first stage a 12 cm. incision is made near the ninth rib and about 6 cm. of the rib are resected. In the second stage the pleural cavity is carefully cleaned, all accessible false membranes being removed from the walls. In the third stage drainage of the cavity is instituted by means of a special drain with a collar at its extremity. The collar is placed in contact with the parietal pleura and the pleura, muscles, and skin are successively sutured tightly around it. Continuous aspiration is obtained by means of a special apparatus with a manometer fixed to the free end of the drain.

In draining the pleural cavity the selection of the lowest point for the insertion of the drain is of only secondary importance. It is the filling out of the lung which, acting like the piston of a pump, effects the aspiration of the fluids in the cavity.

In the 16 cases in which the authors used the method described there were 13 complete recoveries without fistula and 3 deaths. The deaths were due to causes other than the pleurisy and were in no way attributable to the treatment.

The advantages of the method described are that it drains the pleura perfectly if the cavity has been carefully cleaned, empties the pleura by compelling the lung rapidly to resume its normal dimensions, obviates the necessity for painful dressings, and prevents the formation of a fistula.

W. A. BRENNAN.

**Hathaway, F.: The Immediate Closure of Empyemata.** *Brit. M. J.*, 1920, i, 734.

The method of treating cases of empyema described by the author was practised in King's College Hospital twenty-five years ago under Lister. The author's work is therefore not pioneer work,

but he hopes that his results will stimulate others to follow the same procedure. Previous experience in France proved to him that mere rib resection and drainage is not the ideal nor the complete treatment of empyema. Re-expansibility is far more important. This is obtained in two ways: (1) by introducing the whole hand into the pleural cavity, freeing the lung of all adhesions, and removing all fibrinous clots; and (2) by immediate closure of the wound.

Surgery of the chest as practised in France taught the surgeon to avoid the "sucking wound." Why then should a sucking wound be made deliberately in the treatment of empyema? By the use of an open tube the atmospheric pressure in the pleural cavity is made greater than that in the collapsed lung. To make the lung re-expand as soon as possible a vacuum must be created. Expansion is obtained only by immediate closure of the wound after the cavity has been filled with fluid. This method will eliminate cases of long-standing empyema with collapsed lung and persistent sinus which eventually require an extensive Estlander operation. There is no reason why a pneumococcal infection should not be treated in the same manner as a tuberculous infection; in either case the open tube invites secondary infection.

Careful bacteriological studies are essential in every case of empyema. If pneumococci or staphylococci are present the wound may be sutured, but if streptococci are found it is advisable to remove the stitches and treat the cavity by some open method, such as the Carrel-Dakin method, packing with gauze, or drainage.

The operation is done under local anaesthesia but a little general anaesthesia may be required when the lung is handled. A sufficient amount of rib is resected to allow the introduction of the whole hand, either a long portion of one rib or parts of two adjacent ribs being removed. After the evacuation of the pus, all fibrin adherent to the collapsed lung is removed and the lung separated from adhesions. The pleural cavity is then washed out with flavine until the return fluid is clear, when the chest is filled with a 2 per cent suspension of iodoform in sterilized paraffin. The pleural wound is sewed with



catgut, but this procedure is not very important as the stitches soon give way. Deep sutures are used to close the skin in order to prevent the formation of a sucking wound.

Dressing on the following days will show that the wound is bulging as the mixture of pus, iodoform, and paraffin is being pushed out of the pleural cavity by the expanding lung. An exploring needle is introduced daily between the edges of the wound and as much fluid is extracted as possible. Bacteriological examination will show a daily decrease in the number of organisms.

The author has treated by this method nine patients whose ages ranged from 55 to 2½ years. Pneumococci were found in all of these cases except two. Two were cases of mixed pneumococcal and staphylococcal infection and one a case of old tuberculosis. The only failure in the series occurred in the case of a very much debilitated man, aged 44, who had two big abscesses pointing under the skin. In this instance the exploration done by the hand was insufficient. At autopsy the lung was found knotted at the root. The outcome would have been the same if open tube drainage had been established.

The eight other patients made rapid recoveries. The temperature fell at once and the pulse and respiration came down gradually. The duration of the condition varied from two to six weeks after the resolution of the primary pneumonia.

The author suggests further that a soft piece of folded rubber be inserted to permit the gradual evacuation of the paraffin and iodoform. This will do away with the daily use of the aspirating needle and prevent air from entering the pleura while it allows the exit of the pleural contents. Since the idea occurred to him, however, Hathaway has not had an opportunity to test the procedure.

M. R. HOON.

**Horsley, J. S.: Benign Tumors of the Breast.**  
*South. M. J.*, 1920, xiii, 356.

The education of the public in recent years regarding cancer has very considerably changed the types of tumors of the breast seen by the surgeon. Formerly benign tumors were not observed frequently and by some surgeons even these were viewed with suspicion. Women are now going to their physician or their surgeon soon after they discover a lump in the breast. They have learned that cancer in the early stages is not painful and that a lump in the breast is always a serious matter.

While it is extremely difficult to diagnose tumors of the breast in the early stage, diagnosis is vital because many benign tumors of the breast are potentially malignant and the chances of curing mammary cancer decrease with its growth.

One of the chief difficulties in classifying tumors of the breast is due to their peculiar nature which is dependent upon the histologic structure of the breast and the marked changes it undergoes during the life cycle. At birth the gland consists simply of an aggregation of radiating ducts with club-shaped

extremities but no real acini. The epithelium of the ducts is frequently in an active state of proliferation which may cause swelling and pain. No histologic change takes place in the gland until the age of puberty, when acini begin to develop. The breast then enlarges and becomes tender and firm. The epithelial elements in the acini and ducts grow rapidly and the ducts become intimately surrounded by a type of connective tissue which Warren has described as clear, almost transparent, rich in nuclei, and in marked contrast to the interstitial connective tissue of the gland. It is this periductal connective tissue which enters largely into many of the benign tumors, and because of its intimate association with the epithelial elements the latter are always present even though the periductal fibrous tissue predominates. At pregnancy lactation produces another marked change in the breast, and at this period the epithelial growth in the gland is at its height. The next change is that which accompanies the atrophy and degeneration of age and disuse. This change usually begins about middle age and occurs particularly in the acini and the interstitial tissue.

Practically all benign tumors are well encapsulated and this encapsulation is one of the characteristics by which they may be differentiated from malignant growths. A malignant growth, however, may develop in an encapsulated benign tumor and extend through the capsule into the breast tissue.

Benign tumors may be classified as: the "blue dome cyst," which was described by Bloodgood and is undoubtedly one of the features of chronic cystic mastitis; periductal fibroma; periductal myxoma; fibro-cystadenoma; papillary cystadenoma; and chronic cystic mastitis.

In operating on benign mammary tumors the growth with the adjacent breast tissue should always be removed for matrices of other tumors often lie in the mammary tissue near a benign tumor. The breast should be reconstructed by layers of sutures of plain catgut and the skin carefully approximated. It is best to make the incision directly over the growth, particularly if there is doubt as to whether or not it is cancerous.

The Warren operation of incising the breast along its lower margin, dissecting it from the pectoral fascia, and removing the tumor from beneath should be undertaken only when the growth is quite plainly benign. Even in such cases, however, mistakes in diagnosis occasionally occur.

The author reports 55 cases of benign tumors of the breast operated on between October 23, 1908 and September 3, 1919, approximately eleven years. As in 4 of these cases there was no microscopic section, only 51 are included in the analysis. The average age of the patients was 33 years. All of them were operated upon for a benign tumor and in all of the cases except 3 the operation for the benign tumor was the chief or the only surgical procedure. In 1 case a hysterectomy was done and

a well-encapsulated tumor of the breast was removed at the same time. The patient died four days later, her death being due entirely to the hysterectomy.

There were 9 periductal fibromata, 19 fibrocystadenomata, 16 cases of chronic cystic mastitis, 2 cases of papillary cystadenoma, and 2 cases of simple or blue dome cyst of the breast.

Malignancy developed later in 2 cases. In 1, the microscopic examination of the original benign tumor showed a papillary cystadenoma. In the other an operation was performed for pain and lumps in the outer and lower quadrant of the breast. A prompt recurrence took place within a few months. A radical amputation was then done, but the patient died with metastases in the mediastinum and liver a year later.

There were also 2 recurrences of benign tumors. In 1 case, after a periductal fibroma had been removed, a benign tumor which proved to be a fibrocystadenoma formed in the same breast. The other patient, from whom a fibrocystadenoma was removed, was operated upon about three years later by another surgeon who removed one large cyst and several small cysts. Apparently therefore this patient developed a chronic cystic mastitis after the primary removal of a single benign tumor.

G. W. HOCHREIN.

**Rodman, J. S.: Precancerous Lesions of the Breast with Special Reference to Chronic Cystic Mastitis.** *South. M. J.*, 1920, xiii, 348.

In devising and carrying out new methods of reconstructive surgery it should not be forgotten that surgery is still engaged in warfare against cancer and that the results obtained today, brilliant as they are when compared to those of four decades ago, must still be greatly improved. Figures are at times misleading, but it is food for thought that in the two years during which we were actually engaged in war only 76,433 soldiers were killed or died of wounds or disease, while during the same period 180,000 people died of cancer in the United States; that as a cause of death cancer ranks with pneumonia, heart disease, tuberculosis, and kidney disease.

One of the organs most frequently attacked by cancer is the female mammary gland. It has been estimated that about one-third of the total number of cancers occur in the stomach and about one-fourth in the breast. Therefore, approximately 25,000 lives are lost annually because of mammary cancer.

The author recently traced 68 patients who were operated upon by his father, the late W. L. Rodman. Of these, 49 (72 per cent) were well three years after the operation; 34 (50 per cent) five years or over; 14 (25 per cent), ten years; and 6 (8 per cent), fifteen years. The great improvement in the statistics from those of four decades ago is due largely to the development of the radical breast amputation. The author believes that as amputation of the breast cannot be made more extensive,

and as the best available statistics show only 50 per cent of cures lasting for five years, the results can be improved only by operation in the precancerous stage. There is a time in the history of every cancer of the breast when it can be removed completely and without even the probability of recurrence or metastasis. It is important, therefore, not only to continue educating the public regarding the very earliest symptoms of cancer of the breast but to go even further and teach them that any abnormal condition of the breast may be potentially malignant and should be carefully watched by a physician who thoroughly understands it.

In 200 consecutive cases of breast disease the following conditions were found:

	Cases	Per cent
Carcinoma .....	83	41.5
Abnormal involution (chronic cystic mastitis) ..	67	33.5
Benign tumors .....	30	15.
Papillary cystadenoma.....	6	3.
Tuberculosis .....	6	3.
Sarcoma .....	5	2.5
Galactocele .....	3	1.5

From this analysis it will be seen that abnormal involution or chronic cystic mastitis is next to carcinoma the most common disease of the breast. This disease, owing to its varied nomenclature, has been so confounded with other mammary conditions that the literature of the subject could not well be more confusing. A few of the names under which the condition has been described are: chronic mastitis, chronic cystic mastitis, general cystic disease, hydatid disease (Cooper), fibrous and glandular hyperplasia with retention cysts (Whitney), senile parenchymatous hypertrophy (Bloodgood), abnormal involution (Warren), intra-acinous cystic epithelioma (Reclus), and cystadenoma (Schimmelbusch).

The author has accepted Warren's classification of the different types of chronic cystic mastitis, the cystic and proliferative. In the cystic form the changes are predominantly in the stroma of the gland. The increased fibrous tissue presses on the ducts and leads to the formation of retention cysts. In the proliferative form the changes are chiefly in the epithelial parenchyma and may be divided into three sub-groups: (1) the acinal, in which there is an increase in the actual number of acini; (2) the proliferative, in which the epithelium is piled up and projects into the acini; and (3) the adenomatous, in which there is still greater epithelial proliferation, the acini being practically one mass of cells. The last type has the most pronounced tendency to become malignant.

Clinically it is quite impossible to distinguish between the several varieties. The macroscopic appearance of the breast, however, is characteristic. On section many cysts are seen, ranging in size from that of the smallest birdshot to that of a walnut. The cyst contents also vary widely, the contained fluid being sometimes as clear as spring water and again amber



colored, greenish, brown, or even black. The breast tissue between the cysts is distinctly fibrous, decidedly whitish in color, and tougher than normal. These gross changes are quite unlike those of a typical carcinoma, which is gray in appearance and much harder, creaks under the knife, retracts and is concave after section, and exudes an abundant fluid when it is scraped.

Ordinarily the diagnosis of chronic interstitial mastitis is not difficult because of certain fairly constant characteristics. It occurs in men only rarely. Judd reports 11 cases in men in a series of 218 cases observed at the Mayo Clinic. The author has observed 3 cases in men aged 29, 45, and 65 years, respectively.

The majority of cases are those of single women or married women who have been sterile or who have not nursed their children and have reached the menopause. In 100 consecutive cases from the author's clinic the age incidence was as follows: 10 to 19, 3 cases; 20 to 29, 11 cases; 30 to 39, 24 cases; 40 to 49, 48 cases; 50 to 59, 8 cases; 60 to 69, 4 cases, and 70 to 79, 2 cases.

All of the author's patients complained of pain or at least a sense of discomfort in the breast. In fact this is the most dependable symptom of the disease and one that in the majority of instances leads to an early diagnosis. Pain is of value especially in the differential diagnosis between the disease under discussion and carcinoma. In its early stages at least, carcinoma is painless. The pain of chronic mastitis is usually confined to the breast, though it may extend down the arm on the affected side. Judd states that it is different from the pain of carcinoma as the latter is radiating. The pain is almost always aggravated at the menstrual period. Not infrequently there is more or less discharge from the nipple. This discharge is often a clear watery or straw-colored serum which exudes from the nipple or may be made to do so on pressure if the adjacent portion of the breast is diseased. In cancer the discharge is sanious. If it is pure blood, it is significant of another pre-cancerous condition, papillary cystadenoma.

On examination the affected breast is found to be a trifle larger than the other. Prominence of the superficial veins is practically a constant sign. Instead of one definite tumor mass as in carcinoma, there are several irregular masses which are tender on pressure and not adherent to the overlying skin. The axillary glands are often enlarged and tender.

In the operative management of chronic interstitial mastitis the potentialities of the condition must be borne in mind and too much rather than too little should be done. It is the author's belief that no one can be sufficiently skilled in recognizing the pathology of the condition to say definitely which cases are benign and which have become or are apt to become carcinoma. Therefore it is his practice to have a frozen section of the portion of the gland which appears most diseased to the naked eye examined immediately by a competent pathologist.

It is important to consider the patient's age in deciding upon the type of operation to be performed. In young, unmarried women whose chance for happiness would be lessened by the removal of the entire gland, it is justifiable to do a resection provided the facts are made known to the patient and she consents. This plan of course is to be followed only when the pathologist reports the growth benign.

Rodman has removed a large part of the gland subcutaneously, several times using the same incision as that employed in plastic resection by Warren's method. In this way he avoids disfiguring the patient and interfering with subsequent lactation.

Whenever it is necessary to remove the entire gland he uses the same technique as that employed in amputating the breast for carcinoma. This he believes is advisable when the patient is over 35 years of age.

G. W. HOCHREIN.

**Calcagno, B. N.: Mammary Cancer in Man; Extirpation and Axillary Dissection under Local Anæsthesia** (Cancer del mamelon en el hombre. Ablación y vaciamiento axilar bajo anestesia local). *Rev. de la Asoc. med. argent.*, 1919, xxxi, 558.

The cancer described by the author was of the scirrhus type and began in the nipple. It was due probably to functional inactivity and mechanical irritation. The patient was of advanced age and the cancer of fairly rapid development, spreading by way of the lymphatics.

The problem of surgical intervention was complicated by the question as to the type of anæsthesia which would be most advisable. The patient was over 70 years of age and it was thought that neither his heart nor his lungs would tolerate a general anæsthetic. It was decided therefore to use infiltration of a local anæsthetic in both the dissection of the brachial plexus and the removal of the primary focus. The anæsthesia of the brachial plexus was induced according to Hirschel's method. The operative field was surrounded by two zones of injections, one intradermal and the other subcutaneous. Some of the solution was introduced also beneath the pectoral muscles.

Extirpation of the tumor and axillary dissection were done according to Halsted's method. The axillary tissue and the primary neoplasm were removed in one mass without fragmentation. The incision was partly closed near the center and large open areas were left at both ends. In the axilla and at the level of the nipple two tubes, each containing 100 mg. of radium, were inserted into the wound and left in place for twenty-four hours.

In the period of convalescence there was an intense congestion of the left lung base. The temperature, however, returned to normal in four days. When the radium was removed an intense redness of the neighboring skin was noted and for a few days there was a foetid secretion. Later the tissues sloughed on both sides of the wound and healing followed in due time.

W. R. MEEKER.

## TRACHEA AND LUNGS

**Hedblom, C. A.: Foreign Bodies of Dental Origin in a Bronchus.** *Ann. Surg.*, 1920, lxxi, 568.

It is possible that a large proportion of cases of foreign bodies of dental origin in the bronchi have not been recorded since of Weist's 1,000 cases only 103 were from the literature, the other 897 having been collected by personal communication.

In the past four years at the Mayo Clinic there have been 7 cases of pulmonary suppuration following dental operations or trauma. In 2 cases the tooth was expelled spontaneously; in 1 it was discharged through a thoracotomy wound; and in 1 it was found during the postmortem examination. In the other cases no foreign body was found. The author reports these 7 cases in detail and reviews 45 proved cases from the literature. In the 52 cases the foreign bodies were as follows:

	Cases
Teeth .....	37
Artificial teeth .....	4
Dentures .....	2
Root canal broach .....	2
Dental burr .....	3
Allen's dental cement .....	1
Plaster of Paris .....	1
Hard rubber from gag .....	1
Blade of forceps .....	1

The bodies were found most often in the right lower lobe. In 26 cases the accident occurred during tooth extraction under general anæsthesia.

The symptoms are those which are manifested immediately and those due to the prolonged presence of the foreign body in the bronchus. Coughing is the most common symptom and is frequently associated with dyspnoea, cyanosis, wheezy respiration, pain in the chest, and nausea. In 7 cases there were no symptoms. In 36 cases of the series there was evidence of pulmonary suppuration. In the 16 uncomplicated cases the symptoms were marked in 7 and not mentioned in 9. The diagnosis was made by the X-ray in 5 cases. In 4 cases the foreign body was expelled spontaneously; in 10 cases bronchoscopic removal was effected. Two patients died following bronchoscopy and thoracotomy.

In the 36 complicated cases late symptoms developed. Coughing, which was usually associated with purulent sputum, was present in 29; hæmoptysis in 8; and pain in the chest in 11. In 16 X-ray examinations the foreign body was shown in only 4. In 5, an abscess was revealed, and in 1, limitation of movement of the diaphragm. Five patients were treated by bronchoscopy, 3 successfully. Fifteen were treated by thoracotomy and in 13 cases the drainage operation for the suppurating process was done.

Three of the 13 patients who spontaneously expelled the foreign body died. Nine of the 15 patients on whom a thoracotomy was performed made a complete recovery; 2 were greatly improved; and 4 died. The postmortem findings in the 9 fatal

cases were empyema, bronchiectasis, abscess, ulcerated bronchus, and gangrene.

In making a diagnosis of foreign body in the bronchus the history of the case is of first importance. A positive diagnosis may be made by means of the history, X-ray, or bronchoscopy. In early uncomplicated cases bronchoscopy is the best method of diagnosing the condition and removing the foreign body. If the foreign body is not expelled spontaneously, bronchoscopy is the only method of treatment to be considered in early uncomplicated cases. Thoracotomy should be reserved for cases in which there is suppuration.

V. C. HUNT.

## MISCELLANEOUS

**Moynihn, B.: Surgery of the Chest in Relation to Retained Projectiles.** *Brit. J. Surg.*, 1920, vii, 444.

The author asks, "What is the fate of patients who have received wounds of the chest and who harbor a projectile within the thoracic cavity?"

The evidence of the seriousness of the discomforts to which patients of this type are subject is conflicting. Smooth bullets may give as much trouble as ragged shrapnel, and sterile missiles as much trouble as infected missiles. The location of the foreign body apparently has no influence on the symptoms.

In the discussion, of the pathology, the wound of entrance, the path of the projectile, the condition of the pleural surface, and the infectivity of the missile are considered. The damage depends upon the size and shape of the projectile and its velocity. Portions of bone from the ribs or arm and fragments of clothing may be carried with the projectile and lodged in the parenchyma of the lung. It is miraculous that more damage is not done to large vessels and other vital structures.

The pathologic changes in the soft parts of the lung do not differ markedly from those in other parts of the body. When the lung is grasped in the hand the path of the projectile may be felt as a thickened cord. Sometimes the foreign body is partially surrounded by inflammatory elements, but complete encapsulation is rare. In some cases there is hepatization of the lung in the area surrounding the site of the projectile.

The condition of the pleural surfaces varies widely. Adhesions of both pleural surfaces, which usually are present, may be filmy or dense and either localized or generalized over the whole lung. The lobes of the lung may be adherent to one another, or the lung may be adherent to the pericardium, diaphragm, or mediastinum.

Of 18 projectiles examined bacteriologically, 7 were sterile. The bacteria present were staphylococcus aureus, streptococcus-pneumococcus, and coliform bacilli.

Pain on the affected side is one of the major symptoms. It is described as sticking, stabbing, or burning in character, or as a soreness. It is in-



creased in intensity by exertion, but is fairly constant. The amount or the severity of the pain apparently has no relation to the size of the projectile, to any previous operative procedure, the presence of empyema, restriction of the diaphragm, or the physical signs noted. It has been observed, however, that in cases of localized adhesions along the track of the missile, pain and tenderness are especially noticeable.

Dyspnoea is variable in its manifestations. It may be present all the time or come on with exertion. The degree of distress does not always correspond to the deformity of the chest or the amount of physical disability.

Cough, which is frequent, is due to sinuses leading to the pleural cavity or lung, infection around the foreign body, bronchiectasis, or emphysema. Haemoptysis may occur but is not severe. The expectoration, which may be frothy, abundant, purulent, and offensive, ceases only after the removal of the projectile. There is frequently a history of chilliness and some rise of temperature in the evening for two or three days at a time. Palpitation and pain over the heart have been noted.

The author believes that the danger of pneumothorax has been greatly exaggerated. Air is introduced slowly into the pleural cavity and the only effect produced is a temporary cessation of respiratory movements. The only serious risk is the possibility that the opposite pleura may be opened, a double pneumothorax being thus produced.

In many cases pleural adhesions are formidable and their removal leads to the belief that they might account for much of the discomfort. In cases of infection about the foreign body, postoperative empyema may occur following the stripping off of the adhesions. Complete haemostasis should be effected if possible, and if oozing occurs, drainage may be instituted for not longer than thirty-six hours.

Ether has been the anæsthetic chiefly used, with a preliminary injection of morphine, scopolamine, and atropine. Deep anæsthesia is continued and oxygen is given under the mask by means of a rubber tube. The respiratory rate is about normal but the excursions are shallow. The essential point is to secure anæsthesia of a sufficient depth before the chest is opened; otherwise a cough ensues.

In spite of various criticisms the X-ray has proved to be of value during the operation. The open method must be used in approaching the hilum or heart. The X-ray method can not be employed when the projectile is too large to be extracted between the ribs. The X-ray is the only accurate means available to determine the location of the foreign body. This is done both by plates and screen examinations.

The advisability of operation is dependent upon: (1) the persistence of subjective symptoms, (2) the conditions of the foreign body and the lung surrounding it, and (3) the conditions of the pleural cavity.

The method of Petit de la Villéon is used in conjunction with the X-ray both in localizing the foreign body and in its removal. A small incision is made and a special forceps with a blunt end and long parallel blades on one side of the hinges and short "crocodile-jaw" blades on the other is introduced. The guidance of the instrument depends upon the X-ray. When the image of the blades coincides with that of the foreign body the "crocodile-jaws" are opened and the foreign body is grasped and withdrawn slowly. Many theoretical objections to this operation have been overruled by experience, and under certain conditions it is the procedure of choice. Contra-indications to its use are: (1) the proximity of the missile to the lung hilum, (2) the proximity of the missile to the heart, (3) the size of the projectile, (4) suppuration around the missile, and (5) the presence of other foreign bodies than that shown on the screen.

Marion's method avoids the production of a pneumothorax by fixing the lung to the parietal pleura before an incision is made in the lung. This is its only advantage and it is not widely employed.

Duval's open operation is the most extensive and most commonly used of all methods. The exposure is made by incising through to a rib, preferably the third, fourth, or fifth, and after the costal cartilage has been cut through with a dove-tail incision, retracting the rib with a gauze strip. Pneumothorax is produced slowly by making a small incision in the pleura. Respiratory embarrassment is thus avoided and free exploration of the pleural cavity and manipulation of the lung are allowed. The foreign body may be removed with a blunt forceps or by incision. Gentleness in handling the lung lessens the subsequent respiratory distress. The wound must be left dry as a small amount of oozing will cause embarrassment in breathing. The complications that may occur are hæmoptysis, respiratory distress, emphysema (surgical), and infection of the wound or pleural cavity.

Operations on the root of the lung are particularly hazardous because of its extreme vascularity and fixity and the difficulty in distinguishing a foreign body from a bronchus.

In operating on the mediastinum special methods have been devised to give ample access:

1. LeFort's modification of Delorme's method. This consists in making a costal flap with an external hinge and raising the flap by simple elevation or by causing a greenstick fracture. The method provides ample light and permits complete exploration of the thoracic cavity.

2. LeFort's method by which an intercostal incision is made and the supra- or subjacent costal cartilages are divided. This gives a working space of 12 cm. The incision should be made slightly below the level of the foreign body to be extracted.

3. Duval's method, which consists of turning upward and outward a flap comprising the clavicle, the first rib, and the upper outer segment of the manubrium sterni. This gives approach to the arch

of the aorta, the origin of the carotids, the internal portion of the apex of the lung, the brachiocephalic trunks, the subclavian veins, and the entire half of the superior mediastinum.

4. A method used by Duval in which the sternum is divided at the median line and the pericardium is incised. This is of advantage supposedly in operations on the right heart.

Whatever the method used the essential requirements are sufficiency of light and the avoidance of permanent mutilation.

In summarizing his experience the author makes the following statements:

Forty-nine patients were treated by operation. One died from hæmorrhage after the removal of a foreign body from the root of the lung, and 1 from sepsis following the removal of an infected foreign body. Forty-three patients responded to follow-up letters as follows: Twenty-four were in perfect health and able to do heavy work; 14 still have some shortness of breath or are a little better since operation; 3 are unable to work at all; 5 developed empyema after operation; and in 7 cases blood collected in sufficient quantity to require aspiration.

The protocols of the operations are given in detail.

O. C. MELSON.

**Wassermann, S.: Mediastinal Emphysema** (Das mediastinale Emphysem). *Wien. klin. Wchnschr.*, 1920, xxxiii, 122.

During the last influenza epidemic the author observed in 4 cases swelling in the neck, in the fossæ

supraclavicularis, and in the upper anterior and posterior thoracic wall which, because of the crepitus, was recognized as emphysema. Percussion elicited tympany all over the sternum, cardiac dullness being entirely absent. Death occurred in all 4 cases and 3 came to autopsy. Very extensive pneumonia was found. The mediastinum was filled with air; also the connective tissue internal to the sternum and external to the parietal pericardium.

The phenomenon which must be considered extremely unfavorable from a prognostic point of view is the over-distention and rupture of the lung alveoli resulting from the decrease in the lung tissue available for respiration. The air gets into the connective tissue, creeps along the bronchi to the hilus of the lung and the mediastinum, and finally reaches the neck and thoracic wall.

In the literature the following symptoms are also mentioned: a peculiar up and down rubbing sound (Laennec); a hyperresonant percussion note over the lung and the disappearance of cardiac dullness (F. Mueller); synchronous cardiac crepitus and weakness of the respiratory murmur (Fraenkel); and very severe attacks of cardiac stenosis (Fraenkel).

The cardiac stenosis, which Wassermann also observed, is attributed to the involvement of the pericardium (irritation of the nerves). Another important diagnostic sign is the rapid rate of respiration.

Early diagnosis is facilitated by the X-ray. In children mediastinal emphysema occurs quite often in bronchopneumonia and pertussis. JASTRAM (Z).

## SURGERY OF THE ABDOMEN

### ABDOMINAL WALL AND PERITONEUM

**Biggs, M. H.: Pseudomyxoma Peritonei.** *Ann. Surg.*, 1920, lxxi, 619.

Pseudomyxoma peritonei has received but scant recognition by American observers and writers. It results from the rupture of a pseudomyxomatous cyst of the ovary or appendix, the epithelial cells thus discharged being implanted on the peritoneum where they produce pseudomucin and tumor formation.

The condition was originally believed to be secondary to a cyst of the ovary, but is now known to originate also in the appendix.

Failure of pseudomyxoma peritonei to result from rupture of a pseudomyxomatous cyst is explained by: (1) the infrequency of rupture of the smaller loculi which contain cells that are active but firmly adherent to their basement membrane; and (2) thinning of the walls of the larger loculi, the cells at the point of rupture not becoming implanted easily.

The symptoms are those produced by mechanical interference with function. The findings at operation vary from a small amount of jelly-like material

and irritation of the peritoneum to a large quantity of thick, tenacious material and secondary tumor formation of the peritoneum covering the abdominal viscera. The author describes a fine pebbly appearance of the peritoneum which he considers characteristic of the early stage of pseudomyxomatous development.

Age should be taken into account in the diagnosis. The lesion occurs in advanced life, after the menopause in the female, at a time when many other conditions may be excluded. The average age of the author's patients was over 60 years.

At operation it is important to remove all the original growth. When this is done and a careful toilet of the peritoneum is made, early cases may be cured.

The author's conclusions are as follows:

1. Pseudomyxoma peritonei is much more frequent than is generally believed.
2. It is caused by cellular implantation.
3. It is histologically benign, but may be clinically malignant.
4. If it is considered a form of cancer, it must be assumed that pseudomucin inhibits its destructive power.



5. It may originate in the ovary or the intestinal tract, but ovarian origin is by far the most frequent.
6. If it is appendiceal in origin, the appendix has been the seat of chronic inflammation.
7. Early invasion of the peritoneum is characterized by a pebbly appearance.
8. In early cases the condition is sometimes cured and at any stage may be inhibited by operation.

### GASTRO-INTESTINAL TRACT

**Burrows, W. F., and Burrows, E. C.: Common Forms of Gastro-Intestinal Tuberculosis.** *Internat. J. Surg.*, 1920, xxxiii, 142.

Tuberculosis of the gastro-intestinal tract is not a rare disease and we now have a definite concept of the affection and its pathology, symptoms, and treatment. We find that in this affection the disease is localized and associated with an attenuated or bovine form of infection. The author discusses the condition under the following heads:

1. Gastric tuberculosis. Gastric tuberculosis is an uncommon affection because of the acid reaction of the stomach contents, the resistance of the gastric mucosa, and the rapidity of the evacuation of the food from the stomach. When it does occur it is usually associated with advanced pulmonary tuberculosis and is characterized by symptoms of intractable gastric ulcer and marked nutritional disturbances. The prognosis is poor and the treatment is practically that of pulmonary tuberculosis.

2. Peritoneal tuberculosis. This affection is usually secondary to tuberculosis of the pleura, intestines, mesenteric nodes, and fallopian tubes rather than pulmonary tuberculosis. There are three types: the miliary, the caseous, and the adhesive.

In the miliary type of peritoneal tuberculosis the abdomen is doughy and distended. A serous or serosanguinous exudate is found and tubercles are disseminated upon the abdominal and visceral peritoneum. The course of the condition is acute. Surgery is of little benefit.

The caseous type of peritoneal tuberculosis is associated with a bowel-wall involvement and is frequently found in cases of ileocaecal tuberculosis in which the process has penetrated the wall of the bowel and formed caseating tumors with matting of the intestinal walls. The course is subacute. In favorable cases in which the lesion is limited to the ileocaecal region excision of the mass with anastomosis is sometimes practicable. If it is not, the prognosis is unfavorable.

The adhesive type of tuberculosis of the peritoneum is caused by the passage of attenuated or bovine tubercle bacilli through the lymphatics of the intestinal wall. It is marked by the usual abdominal distention, and by pain, tenderness, a doughy feeling, and ascites. When the abdomen is opened extensive adhesions are found and the omentum is usually discovered to be retracted into the upper abdomen. In many cases exposure of the abdominal cavity to the air or washing it with saline solution,

weak hydrogen peroxide, or weak bichloride of mercury solution effects a cure.

3. Enteric tuberculosis. This condition is almost always an acute process associated with progressive pulmonary tuberculosis and general miliary tuberculosis of the peritoneum. It is not suitable for surgery.

4. Appendiceal tuberculosis. Appendiceal tuberculosis is not an infrequent affection. If neglected, it may result in the ileocaecal type. Surgery has given excellent results.

5. Ileocaecal tuberculosis. Ileocaecal tuberculosis is a subacute, slowly progressing disease marked by a mass in the lower right quadrant and usually associated with advanced pulmonary tuberculosis. Excision is indicated if the general condition is favorable. Otherwise palliative measures with short-circuiting of the bowel are all that is feasible.

6. Rectal tuberculosis. Rectal tuberculosis is typically hypertrophic in character and is caused by attenuated human or bovine tubercle bacilli. Increasing stricture of the bowel is the chief complication and usually involves the rectal ampulla and the entire circumference of the bowel for a distance from 2 to 5 in. In many cases excision with the formation of an artificial anus results in a complete cure.

7. Anal tuberculosis. This condition occurs in three forms: (1) tuberculous fistulæ, (2) tuberculous skin involvement, and (3) secondary tuberculous involvement of the deeper anal structures. It is an uncommon condition which runs a more acute course than the rectal and caecal types. The pain is more severe and usually is associated with tuberculosis elsewhere. The treatment is operation combined with treatment of the rectal involvement or of tuberculosis in other parts of the body.

Taken as a whole, the prognosis of gastro-intestinal tuberculosis complicating pulmonary tuberculosis is not favorable.

LOUIS HANDELMAN.

**Carman, R. D.: The Roentgenology of Tuberculous Enterocolitis.** *J. Am. M. Ass.*, 1920, lxxiv, 1371.

The roentgen ray furnishes the most certain means yet available for the early recognition of tuberculous colitis. A lesion in the ileocaecal coil, especially if it is associated with pulmonary tuberculosis, is probably tuberculous. The distal segment of the colon is seldom invaded.

The nodular form of tuberculosis of the intestine can scarcely be recognized roentgenologically unless it encroaches on the lumen of the bowel. In the ulcerative type the roentgenogram shows irregularity of bowel contour. In the terminal stages there is obstruction. In the fibrous type, which is the terminal stage of healing tuberculous colitis and pericolicitis, the roentgen picture is practically the same as in the ulcerative type. The three types are usually associated to a greater or less extent, dependent on the stage of the disease.

The enema is ordinarily employed in the examination for tuberculous colitis and is preferable to the

ingested meal as it will demonstrate the disease earlier. The latter method is used in tuberculous enteritis, observations with the screen being made from the sixth to the eighteenth hour.

The roentgenological signs of tuberculous colitis are: (1) filling defect; (2) spastic phenomena; and (3) obstruction.

The presence of a filling defect and the localized absence of the barium shadow in the cæcum and the ascending colon are usually indicative of tuberculous colitis. The filling defect is the first and most important sign and is caused by the ravages of the disease plus spasm. Some degree of spasm is associated with many if not all gastro-intestinal lesions, and the deformity and narrowing thus caused may be visualized in the early stages of the disease when there is no gap in the barium shadow of the ingested meal. The irregularity of contour due to spasm is of diagnostic value even when the lesion itself is not demonstrable. The absence of barium from an involved area is due usually to spasm or infiltration of the intestine rather than to hypermotility.

Although the author has found tuberculosis to be more frequent in the small than in the large bowel, the roentgen diagnosis is less certain in tuberculous enteritis than in tuberculous colitis, probably because of the physiological and anatomical differences between the small and large bowel. Obstruction, which is occasionally noted, is not characteristic for it is observed also in other pathologic conditions. However, the author states that he has noted another sign which may have diagnostic value, namely, delay with irregular filling and segmentation of the small bowel, but that further study will be necessary to establish this fact.

J. E. McCORVIE.

**Willson, H. S.: Some Observations on 100 Cases of Carcinoma of the Stomach.** *J. Lancet*, 1920, n. s. xl, 185.

Carcinoma of the stomach has been found at all ages and is quite frequent before the so-called cancer age. The rising line, starting at 3 per cent before 30 years of age, more than doubles with each decade up to the decade between 60 and 70 from which point it rapidly descends.

Frequently the tumor never becomes palpable during the entire course of the disease. This depends on the location and character of the growth and the patient's habitus. In 100 cases 86 per cent were inoperable but 31 per cent were explored. The location of the growth was as follows: 5 involved the entire stomach; 47 were in the pars pylorica; 8 in the pars pylorica and media; 17 in the pars media; 5 in the pars media and cardia; and 18 in the cardia.

The X-ray was positive for a lesion in 100 per cent, but could not differentiate between ulcer and carcinoma in all cases.

After two years only 2 of the 100 patients are alive.

H. A. McKNIGHT.

**Douglas, J.: Sarcoma of the Stomach.** *Ann. Surg.*, 1920, lxxi, 628.

The author reports 3 cases of sarcoma of the stomach and reviews the literature on the subject, giving a brief outline of the surgical treatment of the disease.

Sarcoma of the stomach occurs in 1 per cent of all cases of stomach tumor. The average age of incidence is 41.6 years while that of carcinoma is 61.2 years. Lymphosarcoma develops earlier than the other forms.

Round-cell and lymphosarcoma are the most common forms. They are apt to be infiltrating, but the round-cell sarcoma may project into the stomach or form pedunculated tumors. They result in ulceration oftener than other sarcomata, but not as frequently as carcinoma. Spindle-cell and myosarcoma are apt to form large exogastric tumors.

While statistics show that the most common site of sarcoma of the stomach, especially of the infiltrating form, is in the region of the pylorus, other portions of the stomach are frequently involved and the pylorus itself is less often attacked by sarcoma than by carcinoma. Sarcoma of the stomach also forms metastases less rapidly than carcinoma and therefore the operative prognosis should be better.

The diagnosis can rarely be made with certainty. The most valuable evidence is furnished by the X-ray. When in a case of gastric tumor in a patient below the cancer age a short history of gastric disturbance is given, there is absence of blood in the gastric contents and stool, free hydrochloric acid is found, there is absence of cachexia and the presence of anæmia, the diagnosis of sarcoma is to be considered although these findings do not necessarily rule out cancer, ulcer, or syphilis of the stomach.

The author has been able to find 230 authentic cases of sarcoma of the stomach in the literature available. Sixty-nine operative cases reported in the lists of Ziesche and Davidsohn and Frazier, 8 cases collected from the literature by Nedina and Egana, 1 case reported by Forne, the 11 cases reported in this paper, and the author's 3 cases, make a total of 92 operative cases. Sixty-nine of the operations were resections of the exogastric tumor or of part of the stomach and 23 were gastro-enterostomies or exploratory laparotomies.

The author gives complete clinical data on his own 3 cases and photomicrographs of the specimens.

P. M. CHASE.

**Hardt, A. F.: The Diagnosis and Treatment of Congenital Pyloric Stenosis.** *Pennsylvania M. J.*, 1920, xxiii, 444.

The etiology of congenital pyloric stenosis is still unsettled. The majority of cases are those of breast-fed male infants less than 8 weeks of age. The pathology consists of a hypertrophy of the muscle fibers of the pylorus. The early symptoms begin with a regurgitation which gradually increases to vomiting of the projectile type. After the child has been



given 2 or 3 ounces of food and placed on its back a peristaltic wave passes from the cardia to the pylorus. A tumor, usually in the form of a small movable mass, may be felt to the right, above the level of the umbilicus. The stools and urine are scanty and there is progressive loss of weight.

Fluoroscopic examination, for which a small amount of bismuth is added to the mother's milk, is of great value in the diagnosis. Congenital pyloric stenosis must be differentiated from pylorospasm but in the latter the vomiting and peristalsis are less marked and appear in older infants and there is absence of tumor.

In mild cases with slight retention and little loss of weight expectant and medical methods may be tried. In severe cases operation should be done early to prevent a weakened and starvation condition. Local anæsthesia is becoming more favored in these cases as in cases of strangulated hernia. At present the Rammstedt pyloroplasty is the operative method of choice, but Strauss has obtained excellent results with his original method.

The postoperative treatment consists of the application of heat externally and hypodermoclysis if necessary. In the postoperative feeding the routine of Holt and Downs may be followed:

One-half hour after operation, if a general anæsthetic has been given, and as soon as the patient has been returned to bed, if a local anæsthetic has been used, 10 ccm. of water may be given and one and one-half hours later, 4 ccm. of barley water and 4 ccm. of breast milk. Two hours later 8 ccm. of barley water and 8 ccm. of breast milk are allowed. Subsequently breast milk alternated with water is given every three hours, the amount of milk being increased until at the end of forty-eight hours 30 ccm. of breast milk are given with 4 ccm. of barley water. After forty-eight hours the barley water is discontinued and each day the amount of milk is increased 5 ccm. at a feeding until 60 ccm. are given every three hours. Castor oil should be prescribed twenty-four hours after operation.

Postoperative vomiting may be decreased by placing the child in the upright position after feeding, by the passage of a soft rubber tube into the stomach, or by lavage.

R. R. MUSTELL.

**Maylard, A. E.: A Lecture on Partial Pyloric Obstruction.** *Brit. M. J.*, 1920, i, 626.

The causes of partial pyloric obstruction may be anatomical or pathological; the latter is dependent on inflammation or new growth formation.

The author describes a type of congenital narrowness to which he and others have already called attention and states that in his opinion it is the result of over-development of the pyloric ring. A constriction is formed which in some instances will not admit the tip of the index finger. This is due to an excess of reduplication of the pyloric fold. Usually the ring may be dilated without causing laceration, which is not the case in lesions of inflammatory origin. In support of his theory Maylard cites

variations found in the lumen of other orifices in the body.

Hypertrophic stenosis also is mentioned as a cause of obstruction. The œdematous inflammatory thickening in obstruction due to chronic inflammatory ulceration is of greater moment than the cicatricial contracture. Chronic ulceration is the most frequent cause of obstruction.

Benign tumors may obstruct the pylorus either by ball-valve action from within or by pressure. The most common obstructing tumor, however, is carcinoma.

In reviewing the symptoms of gastric cancer the author states that they be considered the physiological response of the muscle under adverse conditions to obstruction at the outlet. Hypertrophy is followed by atony if nourishment and rest are denied.

Rest and diet may give some relief in cases of partial pyloric obstruction but to ensure complete success the obstruction must be dealt with directly or circumvented. In the former case the author advocates gastroduodenostomy by Finney's method if the obstruction is benign and the part can be mobilized. In the latter case gastrojejunostomy is to be preferred.

J. W. ROSS.

**Robbin, L.: The Length of the Large and the Small Intestine in Young Children.** *Am. J. Dis. Child.*, 1920, xix, 370.

In a series of autopsies on 185 children at the Babies' Hospital, New York, it was found that the large intestine was between 80 and 130 per cent of the length of the body in 91.3 per cent of the cases, between 50 and 80 per cent of the body length in 5.4 per cent, and between 130 and 160 per cent of the body length in 3.24 per cent.

The normal range of variation may be assumed to be between 80 and 130 per cent of the body length. The remaining 8.6 per cent of the total cases may be considered abnormal. In 10 cases in which the large intestine was short no clinical association could be discovered between the causative factor of illness or death and the measurements.

In the 6 cases of abnormally long intestine one patient had chronic constipation; 3, intestinal disturbances; and 3, abdominal distention.

The small intestine was short in 16.8 per cent of the cases, of medium length in 79.95 per cent, and long in 3.25 per cent, varying between 500 and 900 per cent of the body length. There seemed to be no clinical relation between unusual shortness or length of the small intestine and chronic constipation or distention.

An unusual length of either the large or small intestine was not associated with an abnormality of the other bowel.

From these facts it may be assumed that any abnormality of the small intestine is not associated with clinical manifestations but an abnormally long large intestine may cause considerable disturbance in later life as the greater part of the increased length is in the sigmoid portion.

R. R. MUSTELL.



**Prat, L.: Pointed Foreign Bodies in the Intestine: Intracæcal Pins and Their Extraction by the Appendicular Route** (Corps étrangers piquants de l'intestin; les épingles intra-cæcales; leur ablation par voie appendiculaire). *J. de chir.*, 1919-20, xv, 624.

The author reports two cases of pointed bodies in the intestine. Generally the movements of the intestine and the progression of the intestinal contents favor the spontaneous evacuation of foreign bodies, but often pointed objects such as pins are arrested in their progress and fall into the cæcum where they become imprisoned.

The first case reported by the author was that of a child who had swallowed a large-headed pin. When the patient was brought to the hospital complaint was made of abdominal pain about the right iliac fossa. Radioscopy showed the presence of a pin in this region and at operation the pin was found in the appendix.

The second case was that of a child who had swallowed a pin four days before the examination and was suffering from abdominal pain and distension. Radiography showed a pin fixed immovably crosswise in the right iliac fossa. At operation the pin was found blocked in the cæcum where it caused small hæmorrhages into the mucosa. With some difficulty it was moved into the appendix and the appendix then removed.

W. A. BRENNAN.

**Moreton, A. L.: Intussusception Occurring in the Course of Typhoid Fever.** *Brit. J. Surg.*, 1920, vii, 490.

The author calls attention to the rarity of intussusception in typhoid fever and mentions the comparatively few references to the subject found in standard text-books on medicine and surgery. He describes in detail a case that came under his observation and gives short abstracts of ten other cases he found reported in the literature.

These cases are also analyzed. The average age incidence was 21 years. Intussusception in typhoid fever is most apt to occur in the later stages of the disease. The enterocolic variety is the more common. In the enteric type there may be more than one intussusception. The symptoms and signs are those of a sudden abdominal catastrophe of the nature of intestinal obstruction. A mass was felt in three cases and in only one case was there a blood-stained discharge from the bowel.

Most of the cases collected by the author had been diagnosed as perforation. In intussusception, however, the sudden catastrophe is not quite so great as in perforation, the abdominal movements are not restricted, the abdomen is soft, the pain is colicky, a mass may be palpable, the area of liver dullness is not diminished, and the leucocyte count is not increased.

Surgery is indicated and gives good results. Six patients were operated on and five recovered. Of five patients who were not operated on, four died.

The patient who recovered without surgical intervention passed the gangrenous intussusceptum per anum.

The disease condition of the bowel demands that great care be taken in the manipulation at operation. The invagination may be initiated by inflammatory changes in the bowel causing irregular peristalsis or by an enlarged Peyer's patch. J. E. McCORVIE.

**McGuire, S.: The Treatment of Duodenal Fistula.** *Surg., Gynec., & Obst.*, 1920, xxx, 460.

The aggregate number of duodenal fistulæ is large, but as the actual number occurring in the practice of individual operators is small, little has been written on the subject. This is to be regretted as the condition is often fatal and the best method of dealing with it has not been settled.

Duodenal fistulæ follow operations on the duodenum and injuries inflicted on the duodenum in the course of operations on the kidney, gall-bladder, or stomach. They usually develop within from five to nine days at a time when the patient is supposed to be out of danger. In some cases the amount of discharge is small, while in others it is large and consists of all the water and food taken by mouth and all the secretions of the stomach, liver, and pancreas. The irritating effect of the digestive juices on the skin produces great discomfort, and the lack of nourishment and rapid loss of body fluids causes an alarming loss of weight and strength.

If the leak is small and the patient's condition is good, an effort may be made to secure spontaneous closure by packing the opening, withholding all food by mouth, and sustaining the patient by rectal feeding. If the leak is large more radical measures are necessary. When the fistula has followed a nephrectomy and the opening is on the posterior wall of the duodenum direct suture should be done by opening the abdomen through the upper right rectus and mobilizing the duodenum according to the method advised and practiced by W. J. Mayo. When the fistula has followed an operation on the gall-bladder and the opening is on the anterior wall, direct closure is not often feasible because the presence of infection makes manipulation dangerous, the presence of adhesions makes exposure difficult, and the necrotic condition of the bowel wall renders suturing unsatisfactory. For this condition Deaver and others have advised posterior gastro-enterostomy with or without closure of the pylorus. In cases of duodenal fistula resulting from ulcer this is the ideal method as it not only meets the immediate indications but also cures the primary disease. In other cases it cannot be used because of the patient's condition or it results in an anatomical abnormality which is to be regretted.

The author reports a case in which he did a secondary operation for obstructive jaundice due to a stone impacted at the bifurcation of the hepatic ducts. In the separation of adhesions a hole was torn in the duodenum. This was sutured with chromic catgut. The patient did well for nine days and then



suddenly developed a large duodenal fistula. Water and nourishment taken by mouth escaped through the incision as rapidly as it was swallowed. The patient's condition was so desperate that a prolonged operation could not be considered. Hence a simple jejunostomy was done under gas oxygen anæsthesia according the technique described by C. H. Mayo. Water and nourishment were given exclusively through the tube. The improvement was marked and immediate. With the exception of bile from the drain in the common duct, all discharge through the abdominal incision ceased at once and in three weeks the wound closed spontaneously. Feeding by mouth was begun cautiously and as there was no untoward symptom the duodenal tube was removed. There was no leakage and the patient made a complete recovery.

**Gibson, C. L.: The Results of Operations for Chronic Appendicitis; A Study of 555 Cases.** *Am. J. M. Sc.*, 1920, clix, 654.

Two hundred and fifty-nine of the patients traced had no complaint; 65, a minor complaint; 102 were unimproved; and 3 had died. One hundred and twenty-six were lost track of.

Of the 102 whose condition was unimproved 65 had had an obviously pathologic appendix and of this number 66 per cent had had further exploration at the time of the operation. Of the remaining 37 patients 87 per cent had had further exploration. In the author's opinion the lack of improvement in the 65 cases may be due to the fact that in the presence of a pathologic appendix the abdomen was not sufficiently explored for further conditions. In such cases exploration of the upper abdomen particularly is important, especially in the cases of women and those past the second decade of life.

To avoid disappointing results the author recommends:

1. A comprehensive and detailed history.
2. A complete and thorough physical examination.
3. Particular caution in operating on women.
4. Particular caution in operating on the more mature patients, especially women. In this class other lesions may co exist with the appendicitis or be mistaken for it.
5. The avoidance of operation if there is no clear history of well-defined attacks, especially localized pain with nausea or vomiting.
6. A good-sized incision and a search for other lesions even if a pathologic appendix is found.
7. A thorough search for other lesions if the appendix is not pathologic, even if a supplementary incision is necessary.

P. M. CHASE.

**Whitelocke, R. H. A.: Appendectomy by a New Route and a Simplified Procedure.** *Proc. Roy. Soc. Med.*, Lond., 1920, xiii, Sect. Surg., 129.

The operation described was designed by the author for the removal of the appendix vermiformis

through the right iliac fossa when general exploration of the abdominal cavity is not necessary, i.e., in acute rather than in chronic cases. The method is a simple muscle splitting procedure and so successful that Whitelocke employs it in preference to all others.

In 894 operations performed at all stages of the disease and on patients of both sexes varying in age from 3 to 79 there were 19 deaths. The immediate mortality would therefore appear to be no higher than that of any of the other procedures. As regards remote sequelæ, Whitelocke states that there was not a single case of hernia or abnormally weak scar.

E. C. ROBITSHEK.

**Bland-Sutton and others: Discussion of Diverticulitis.** *Proc. Roy. Soc. Med.*, Lond., 1920, xiii, Sect. Proct., 79.

Diverticulitis is a very important clinical condition and is not so rare as was previously supposed. In a series of 24 cases it appeared between the ages of 46 and 68 years. The region most frequently involved was the lower sigmoid. The period of complaint varied from two months to twenty years. The condition has been ascribed to numerous factors such as increased intracolonic pressure due to intra- or extra-abdominal causes, colitis, constipation, and malignancy.

Colitis seems to play an important part in the etiology as it has been noted before as well as after the formation of the diverticula. At first there is a slight catarrhal inflammation of the bowel, the infection passing along the blood vessels and inducing a tight constriction of the bowel wall. This may persist for years. The iliac colon becomes tighter and contracted, and small-cell infiltration results in the formation of a tumor. The saccules lose their muscular coat as the bowel wall is fatty and sodden, and the circular muscle becomes retracted down to the base of the saccules. The diverticula do not present the "tied string" appearance observed in malignancy. A local peritonitis with dense adhesions may develop in the region of the diverticula with perforation of the bladder.

The most frequent symptoms are chronic obstruction, pain in the abdomen, tumor, diarrhoea, fever, acute obstruction, perforation into the bladder, and bleeding. The latter becomes less frequent. The most valuable aid in arriving at a diagnosis is the X-ray. Clinical points of importance are constipation, acute inflammatory attacks with high fever and rigor, the absence of blood, the presence of a large tumor for a long period of time, and perforation into the bladder.

In the treatment colostomy is the most satisfactory procedure. Resection with short circuiting of the bowel is less often possible because of the location of the diverticula. It is not advisable to break up the adhesions as usually such adhesions are very dense and are intersected with septic foci which, if disturbed, may set up an acute peritonitis.

R. R. MUSTELL.

**Chaoul, H.: The X-Ray Treatment of Cancer of the Rectum** (Die Roentgenbestrahlung beim Rectumcarcinom). *Muenchen. med. Wchnschr.*, 1920, lxvii, 179.

To date, the X-ray treatment of rectal cancer has been unsatisfactory. The use of radium within the rectum is more successful. Radiation causes a melting away of the tissue. Faecal obstruction, foul discharge, and pain may also disappear. The results are not permanent, however, as in the periphery the cancer continues to spread. The reason for this is the fact that the radium rays have an intensive action on the cells near them while those farther away are given an irritation dose rather than a fatal dose. A more effective action is obtained at the periphery with X-ray treatment if it is given intensively and from various fields.

Localization is possible by palpation with the finger, the tumor edges being marked with a sound. With maximal radiation by means of Coolidge tubes, 0.7 zinc filter, the results are greatly improved. Following a primary negative stage characterized by malaise, headache, nausea, vomiting, and slight fever, continuous improvement is noticed in about two weeks. So far, only inoperable cases have been treated as in the others surgery is the treatment of choice. CARL (Z).

**Boas, J.: The Cure of Hæmorrhoids without Operation and the Results Obtained** (Die Heilung der Hæmorrhoiden auf unblutigem Wege und deren Resultate). *Arch. f. Verdauungskrankh.*, 1920, xxvi, 1.

Boas treated 62 cases of hæmorrhoids conservatively as follows:

The bowel was cleansed by catharsis and soap-suds enemas. Then, with the patient in the knee-elbow position and under local anæsthesia, suction was applied to the venous knot. Next, a 96 per cent solution of alcohol was injected deeply into the extra-anal knots, 2 ccm. into the small knots and 5 ccm. into those which were larger. After the injection the hæmorrhoids were left outside or pushed high up into the rectum.

Following this treatment the hæmorrhoids became necrotic and sloughed off within a period varying from six to fourteen days.

A patient with a single hæmorrhoid was kept in bed for several days but the bowel movements were not stopped. A patient with numerous hæmorrhoids was kept in bed for four or five days on a liquid diet and given first opium and then a laxative.

The method described is indicated in all cases of prolapsed hæmorrhoids even though they may recede spontaneously. In cases of hæmorrhage rectal injections of 5 per cent calcium chloride are given. In 64 per cent of the cases healing occurred normally, but in 36 per cent it was interrupted by recurrent hæmorrhage, pain, and retention of urine. In 2 cases there was a recurrence.

RAESCHKE (Z).

## LIVER, GALL-BLADDER, PANCREAS, AND SPLEEN

**Cohn, I. M.: Primary Cancer of the Liver.** *J. Lab. & Clin. Med.*, 1920, v, 528.

Primary malignancy of the liver is a very rare condition. It is found in about  $\frac{1}{10}$  of 1 per cent of autopsies, being much more rare than secondary malignancy. The secondary condition is from twenty to forty times as frequent.

The etiology of this disease is unknown. The frequency with which it is found with cirrhosis of the liver has led many to believe that cirrhosis is its cause. Other irritating conditions may be important factors in the etiology. In one case autopsy disclosed the primary nodule being formed about a dead parasite in the liver, and in another leprosy bacilli were found scattered through the stroma of the liver.

Biliary calculi have been associated with carcinoma. There are two views as to their relationship. According to one theory the carcinoma is due to the irritation set up by the calculi. According to the other the growth is the cause of the calculi. In most instances gall-stones are present, but in cases of secondary carcinoma they are rare. Arteriosclerosis has also been advanced as a cause of primary cancer of the liver.

There are three important types of liver carcinoma, namely, massive, diffuse, and nodular. The massive type, which is the most frequent, consists of a large mass inside the liver, the liver tissue forming the shell of the growth. The tumor cells are usually polyhedral or spheroid. The diffuse type, in which there is an infiltration of spheroidal cells in the liver tissue, is very rare. The nodular or multiple primary carcinoma is more common than the diffuse type. It grows rapidly and quickly degenerates. The liver is studded with nodes. The cells are polyhedral or spheroid. A fourth type of primary carcinoma occurs in the cirrhotic liver, and a fifth type is the primary melanotic carcinoma.

The tumor is set in action by an irritation leading to proliferation of the endothelial cells. The contents of the vessels are replaced by an embryonic tissue similar to that from which blood and blood vessels originate. Associated with this process is a rapid destruction of the normal liver tissue. Examination of the carcinomatous cells shows them to be quite similar to hepatic parenchyma. They have a trabecular arrangement, but are larger than those of normal tissue. In many tumors the cells are bile-producing and the tumor may be considered a direct change of liver cells to cancer cells with a hyperplasia of the new formation. The growth is compensatory and proliferates by direct extension.

Metastasis in cases of cancer of the liver comes at a later period than in malignant disease elsewhere in the body and is not so widespread. The retroperitoneal glands, the omentum, and the lungs are involved frequently, but the supraclavicular glands and the heart rarely.



The disease may occur at any age. Several cases have been reported in which it was present at birth. It is more common in men. It may remain latent for several years, but as a rule runs a rapid course and soon causes death.

The earliest symptoms are usually vague gastrointestinal disturbances. After the tumor develops the patient suffers a loss of flesh, cachexia, and digestive trouble. Icterus is present in 63 per cent of the cases; ascites in 58.5 per cent; oedema in 41 per cent; splenic tumors in 32 per cent; and fever in 14 per cent. In 86 per cent of the cases the condition is associated with cirrhosis.

Although primary cancer of the liver is very malignant, operations have given successful results in some cases. The surgical treatment consists usually of excision of the tumor and scraping of the cavity. In more radical operations the entire affected lobe has been removed successfully. In cases in which a recurrence has developed a second operation has been more successful. I. W. BACH.

**McConnell, A. A.: Cyst of the Common Bile-Duct.**

*Brit. J. Surg.*, 1920, vii, 520.

The author reviews 36 collected cases of cyst of the common bile-duct, 35 of which had been reported in the literature. The case reported in this article is that of a girl, 11 years of age, who had had severe attacks of pain for more than a year before her admission to the hospital. The abdomen increased in size and was distended especially in the epigastric and right hypochondriac regions. The appetite became poor, and on one occasion slight jaundice was noticed. On palpation a hard irregular mass was felt extending into the right lumbar region and from the middle of the epigastrium toward the right anterior superior iliac spine. Blood and stool examinations gave normal results, but during icteric attacks bile appeared in the urine.

At operation the duodenum and hepatic flexures were found pushed forward by a large tense cyst. The gall-bladder was independent of the cyst and the liver was cirrhotic. The cyst was found to extend from the extreme right of the abdomen to a point to the left of the midline and to lie between the aorta, vena cava, and right kidney behind, and between the pancreas and duodenum in front. More than a pint of bile was evacuated by aspiration and a small drainage tube was inserted for a week.

Nine months later the abdomen became swollen and tender. The original wound was opened and a large quantity of pus mixed with bile was evacuated. About two years later the patient again returned to the hospital complaining of pain and loss of appetite. When the abdomen was opened the cyst was found to have shrunk to the size of a walnut. The patient's general appearance suggested thyroid insufficiency and on the administration of thyroid extract remarkable improvement was noted.

The salient features of the 36 collected cases are summarized. The average age was 13 years. Five patients were males and the others females.

The growth, which may reach a capacity of 4 to 5 liters, is generally located in the upper and middle portions of the common bile-duct.

The finding of a cyst in a male foetus suggests that the condition is congenital. It is not certain whether the onset of symptoms invariably follows the abnormality or is dependent on some exciting cause.

The combination of jaundice, pain, and a large tumor in a young person should suggest the diagnosis. In only one case was jaundice absent. When pain or tumor are present alone, or when pain and tumor are associated, Ehrlich's test for urobilinogen is of value. A positive reaction definitely indicates organic disease.

Of the 36 patients, 25 died; of 19 patients treated by drainage alone, 18 died. The main reason for this high mortality was the neglect of the surgical principle that a sterile cavity should not be drained. An anastomosis was performed between the cyst and the intestine in the cases of 5 of the 6 patients who recovered. The diagnosis should be confirmed by aspirating the cyst retroperitoneally. When the cyst wall has collapsed an anastomosis should be made between it and the duodenum as in a cholecyst-enterostomy. M. B. KELLOGG.

**Bassler, A.: The Diagnosis of Chronic Gall-Bladder Pathologies.** *Med. Rec.*, 1920, xcvi, 899.

The diagnosis of a chronic gall-bladder condition is made most easily by grouping the symptoms which represent the characteristic entities.

The first type of gall-bladder case discussed is one in which the pathologic condition has been present for many years with remissions of slight symptoms. There is distress in the epigastric region with belching after and between meals and an uncomfortable feeling in the epigastrium. The test meal shows a moderate increase in acidity. The patient is usually a female who has borne children but there was no close association between a child-birth and the symptoms. The bowel examination reveals a saccharobutyric toxæmia. There is some tenderness over the gall-bladder. The X-ray examination is negative. In a case of this kind the condition is probably what is known as a "strawberry" gall-bladder.

Another type of case is that of stout women, frequently of the Semetic or the Teutonic races, whose most distressing symptom is belching. Acidity is above normal. The symptoms began after child-birth. There are slight chills and hyperæsthesia. Distress is felt in the gall-bladder region. Such patients have chronic cholecystitis with inspissated bile.

The third type of case resembles the first two except that in about one-third of the cases there are attacks of colic and jaundice. The acidity is normal or below normal and there is marked gall-bladder tenderness. The condition is probably cholelithiasis and cholecystitis.

The fourth type of case is that in which, with gall-bladder symptoms, there are symptoms of pyloric obstruction due to band formation or

thickened tissue. The patient is usually thin and states that the condition has been present for a very long time. The findings are usually hydrops or markedly contracted and thickened gall-bladder with stones.

The author summarizes his reasons for believing that the X-ray, duodenal aspiration, and determinations of the blood cholesterol cannot be regarded as of great value in the diagnosis.

I. E. BISHKOW.

**Prat, D.: Obstruction of the Gall-Bladder** (*La vesícula biliar tabicada*). *An. Fac. de med. Univ. de Montevideo*, 1919, iv, 813.

The most common etiological factor of gall-bladder colic is the presence of stones. In this variety of colic the stones are usually few and large. In many cases there is only a single large stone. Such a calculus may occupy almost any position but is more commonly found in the fundus. The colic arises from contraction and spasm of the gall-bladder walls caused by irritation due to the stone.

Three pathologic types of gall-bladders are:

1. The usual type. Often in gall-bladder colic the gall-bladder appears normal from without, but a more detailed examination shows that its walls are congested and oedematous and perhaps adherent to neighboring viscera. Adenopathy of the hilus glands is common.

2. A sclerotic gall-bladder. This condition is often found in cases of hydrops with a single stone impacted at the outlet, at the beginning of the cystic duct.

3. The gall-bladder of chronic cholecystitis with enlarged, greatly thickened, fibrotic, and infiltrated walls. The shape is pyriform and the mucosa injected and often ulcerated. There may be adhesions to neighboring organs.

The symptoms are described briefly. They consist of a painful crisis associated with vomiting and enlargement and tumefaction of the gall-bladder, but without icterus or the presence of calculi in the fæces. The pain is localized in the gall-bladder region and often radiates to the back or the right shoulder. It is aggravated by the ingestion of food and by pressure. Nausea and vomiting are usually present but not as marked as in hepatic colic. The liver is not enlarged but the gall-bladder may be palpable and very tender.

This condition must be differentiated from hepatic colic and cholecystitis. It is distinguished from hepatic colic by the fact that the pain is less intense and of longer duration; the crises are usually repeated; icterus, stones in the fæces, and clay stools are absent; and the gall-bladder may usually be palpated. It may be distinguished from cholecystitis by the absence of fever and the fact that the pain is of shorter duration and more intense.

On the basis of the mechanism of obstruction the following types of gall-bladders are described:

1. The gall-bladder of medium size and pyriform shape with congested, oedematous, and possibly

somewhat gangrenous walls. Usually a loose stone is present in an accessory pocket or diverticulum and closes its outlet when forced into it.

2. The hour-glass gall-bladder. This is of medium size and has a diaphragm or stenosis near the middle, the fundus forming a separate compartment in which stones are found too large to pass through the constriction.

3. The gall-bladder with valves of mucosa forming a stenosis at the outlet and causing impaction and walling off of stones which results in permanent obstruction to drainage.

4. The gall-bladder with marked lesions of the walls. The walls are very fibrotic and irregularly contracted as the result of cholecystitis and there are dense adhesions to neighboring structures.

5. An elongated bladder with multiple calculi. Such a gall-bladder may become folded upon itself and retain this shape because of the development of adhesions.

6. The gall-bladder in which obstruction is due to tumors in the wall itself or the pressure of neighboring tumors.

W. R. MEEKER.

**MacCarty, W. C. and Corkery, J. R.: Early Lesions in the Gall-Bladder.** *Am. J. M. Sc.*, 1920, clxx, 646.

The authors classify 4,998 gall-bladders removed at the Mayo Clinic from January, 1913, to January, 1919. Early changes noted were: congestion and oedema of the villi; lymphatic infiltration in the mucosa, submucosa, muscularis, and subserosa; fibrosis of the villi, which sometimes extended into the submucosa; and the presence of a granular lipid substance in the epithelium or mucosa.

In some instances large spheroidal cells filled with the finely granular lipid substance noted in the epithelium or mucosa were found in the mucosa and submucosa. It is this substance which gives the villi in "strawberry" gall-bladders and papillomata their yellow appearance. The early changes do not alter the gross external appearance of the organ or markedly change the macroscopic internal appearance.

Although the early conditions described do not give rise to symptoms forming a definite clinical picture they are undoubtedly responsible for a number of general disturbances of a toxæmic nature.

A. J. SCHOLL, JR.

**Weiss, S.: The Prophylaxis and Treatment of Gall-Stone Disease.** *Med. Rec.*, 1920, xcvi, 869.

The treatment of gall-stone disease should be medical but surgical treatment has its place. From 6 to 10 per cent of cadavers show the presence of biliary calculi. Only 1 of 20 persons with gall-stones have symptoms.

The medical treatment includes the following divisions:

1. The prevention of stagnation by exercise, the wearing of loose clothing, meals at short inter-



vals, and the ingestion of vichy or Carlsbad water or hot water containing sulphate or phosphate of soda.

Exercise causes increased movement of the diaphragm and liver and therefore an increased flow of bile into the duodenum. Horseback riding is best, but bicycling, climbing, rowing, and tennis are also excellent. After pregnancy, massage should be used.

In the dress, corsets, tight waist bands, and heavy skirts should be avoided.

Meals at short intervals are better than large meals at long intervals and the patient should have something to eat before going to bed as when food enters the duodenum bile is driven out by the gall-bladder.

Vichy, Carlsbad, or hot water containing sulphate or phosphate of soda may act as a cholagogue and should be taken in small amounts before meals. The only credited cholagogues are bile salts and salicylate of soda.

2. The prevention of catarrhal inflammation due to gastritis and indigestion by careful dieting, drugs, and the prevention of constipation. For this purpose the administration of phosphates, soda, and mineral waters, exercise, and the elimination of focal infections are of value.

3. The removal of catarrhal inflammation of the biliary and intestinal tracts. In addition to the measures mentioned the abdomen should be kept warm to prevent chilling and if there is tenderness heat should be applied over the gall-bladder.

4. The treatment of gall-stones during and between attacks. If the attacks are severe, morphine or chloroform may be necessary but the author has discarded the former because of its habit-forming tendency. Atropine, belladonna, amyl valerate, and antipyrin are useful drugs. Benzyl benzoate is also to be recommended. At times hot baths or dry heat are of value.

Between the attacks the surgeon may advise the removal of the stones or the gall-bladder, but the stones may form again even in the ducts. A change of occupation may be beneficial. Gentle exercise in the fresh air, deep breathing, and the wearing of warm clothes to prevent chilling are indicated.

Bile acids and salts and salicylic acid may be given by mouth. Other drugs which have proved satisfactory in the elimination of gall-stones are acid sodium oleate, phenolphthalein, and menthol in capsule combination; sodium phosphate, bicarbonate, and sulphate in hot water; eunatrol and oleic acid and turpentine given by enema.

The diet should include a variety of fleshy foods, but the yolks of eggs, peas, fatty meats, all fried foods, and sugar in large quantities are contra-indicated.

The treatment at health resorts is of benefit as it regulates the patient's diet and habits and employs salines. Saratoga Springs is popular for such treatment as well as European resorts.

Vaccines made from the organisms recovered from the bile with a duodenal tube and combined with organisms from other foci of infection are of value. Autogenous vaccines are best. Small doses should be given frequently and increased until a definite reaction is obtained.

Local treatment through the duodenal tube connected with a Murphy drip is also beneficial. Direct medication with magnesium sulphate or some other purgative and with antiseptics may be employed.

Any form of heat applied externally to the hypochondrium is of value.

M. H. HOBART.

**Benedetti, U.: Annular Pancreas** (Contributo allo studio del pancreas anulare). *Pollicin.*, Roma, 1920, xxvii, sez. prat., 81.

The annular form of pancreas is a very rare anomaly. Benedetti has been able to find only 6 cases recorded in medical literature.

In this article the author reports the case of a soldier who died from the effects of wounds of the limbs. The patient had had intestinal and gastric symptoms but the examination of the feces and urine did not suggest the presence of a pancreatic lesion. Autopsy showed that the descending portion of the duodenum was constricted in a stout ring formed by the head of the pancreas. In order to bring the second portion of the duodenum into view it was necessary to cut the ring. The stomach was markedly dilated, the greater curvature being about three finger-breadths below the umbilicus.

Annular pancreas has been ascribed to inflammation but Benedetti inclines to the view of Giannelli who pointed out that the pancreatic islets reach their maximum development in the lower vertebrates and are least developed in the higher vertebrates. He therefore concluded that the annular pancreas in man is the anomalous occurrence of a morphologic condition which in the lower vertebrates is normal.

W. A. BRENNAN.

**Charlton, W.: The Results of Splenectomy in Pernicious Anæmia, with Special Reference to a Case of Pulmonary Tuberculosis** (Bemerkungen ueber die Erfolge der Milzextirpation bei pernicioeser Anaemie mit besonderer Beruecksichtigung eines Falles von Lungentuberkulose). *Therap. Halbmonatsschr.*, 1920, xxxiv, 111.

Encouraged by the results obtained by splenectomy in Banti's disease, the author treated a case of pernicious anæmia similarly. The case was complicated by pulmonary tuberculosis and a previous blood transfusion had been given without benefit. As the result of his observation of the effect of splenectomy upon both pernicious anæmia and pulmonary tuberculosis, Charlton has come to the conclusion that there is no relation between the two conditions and the presence of pulmonary tuberculosis is not a contra-indication to splenectomy in such cases. The patient's general condition as well as the blood picture showed a decided improvement following the operation whereas the lung condition remained uninfluenced and gradually became worse. BODE (Z).

## SURGERY OF THE EXTREMITIES

## DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

**Taylor, A. S.: Brachial Birth Palsy and Injuries of Similar Type in Adults.** *Surg., Gynec. & Obst.*, 1920, xxx, 494.

The author takes issue with those who claim that brachial birth palsy and similar injuries nearly always become cured spontaneously. The percentage of spontaneous recoveries is in reality very small. Such recovery occurs within three weeks if at all. Birth palsy is due to nerve injury varying from overstretching of the brachial nerves to complete tearing or avulsion of the roots and involving one or two nerves or the entire plexus. An injury of this kind results in paralysis of groups of muscles and secondarily in subluxation of the shoulder, contractures of the unparalyzed muscles, and accommodative changes in the shape of the bones.

On pathologic examination torn nerves and nerve sheaths, torn fascia, and muscle with extravasated blood forming hard cicatricial tissue which prevents regeneration of the nerve are found.

The symptoms of the condition are given in detail. The author advocates early operation consisting of exposure and suture of the affected nerves.

Following the operation the arm should be put up in a position to allow relaxation of the affected muscles, i. e., in external rotation and abduction. The head also should be fixed to prevent pulling on the recently sutured nerve. Such fixation should be continued for three months, after which physiotherapeutic measures should be begun.

The author has operated on 70 cases. There were 3 deaths, only 1 of which might be attributed directly to the operation. Taylor does not claim that absolutely perfect physiological recovery will follow the operation but does claim that it will result in marked improvement.

Fourteen cases of injuries of the Erb type in adults were operated upon, but the results in these were not so good as those obtained in children.

The article is well written and the illustrations are excellent.

B. H. MOORE.

**Beninde: The Spread of the Bone Disease Incident to the Hunger Blockade in Prussia; Rachitis, Late Rachitis, and Osteomalacia.** (Die Verbreitung der durch die Hungerblockade hervorgerufenen Knochenkrankungen unter der Bevoelkerung Preussens; Rachitis, Spaetrachitis, Osteomalacia). *Veroeffentl. a. d. Geb. d. Medizinalverw.*, 1920, x, 121.

Since the fall of 1917, and especially since that of 1918, there have developed in Prussia numerous cases of a bone disease which resembles the more severe forms of rickets, late rickets, and osteo-

malacia. While the reports do not indicate the entire extent of the condition, they show that the communities most severely affected are the larger cities and industrial centers.

On the basis of the ages of the patients the disease may be divided into three fairly distinct types. The first and largest group of cases are those of infants and children under 5 years of age. Most of the infants are bottle fed, but breast-fed infants are also affected. Even among the better classes in which infant welfare work is done severe cases of rickets have been rather frequent. The clinical picture is characterized by pain in the bones upon movement, softening, curving and increased friability of the bones, and craniotabes. In the more severe cases it is possible to bend the long bones manually. Children affected do not learn to walk until late, sometimes as late as the sixth year. Those between the second and sixth years of age usually forget how to walk.

The second group of cases are those of children between 14 and 19 years of age. Children between 6 and 14 are rarely affected. The clinical picture of this type is that of late rickets. It is seen most often in males whose bones are overtaxed by much walking, standing for long periods of time, or the carrying of heavy burdens. It therefore occurs principally in the industrial centers. Females are affected only rarely as few are engaged in these occupations. In the first stages pain develops in the overloaded bones but disappears during rest. Later, thickening and curvature of the bones result and pain is felt when pressure is exerted over the epiphyses. The X-ray picture shows ragged, indistinct epiphyses and a lighter area at the ends. In severe cases fractures occur without apparent cause and heal usually with the formation of a pseudarthrosis. In such cases operations on the bone give poor results.

The third group of cases are those of persons above 19 years of age. Persons between 20 and 35 are rarely affected. Most of the sufferers are women between 40 and 60 years of age, especially pregnant women and those in the puerperium. Like osteomalacia, the disease affects principally the legs and the spine and manifests itself by severe pain, curving, and increased friability of the bones. Fractures may occur even while the patient is in bed.

The disease is due undoubtedly to the effects of the war blockade which restricted the supply of nourishing food. To overcome it better food is essential, especially food rich in fat and albumin. Calcium, phosphorus, arsenic, and cod-liver oil are of value. Some authors favor injections of adrenalin. The treatment should include also rest in bed, fresh air, sunlight, artificial heliotherapy, salt baths, and exposure to the ultra-violet rays.

KRAUSS (Z).



**Chapman, H. S.:** *The Results Obtained in the Treatment of Chronic Arthritis by the Removal of a Distant Focus of Infection.* *Ann. Surg.*, 1920, lxxi, 648.

The most common foci of infection are the teeth, the tonsils, the genito-urinary tract, the sinuses, the bronchi, the gall-bladder, the gastro-intestinal tract, the pancreas, and the appendix. Streptococci, gonococci, staphylococci, and pneumococci are the organisms most frequently found and arthritis, nephritis, gastric ulcer, endocarditis, myocarditis, iritis, and hyperthyroidism are the most common conditions due to distant foci of infection.

Bradford in 1883 reported two cases of so-called rheumatic arthritis of the spine in which there was a history of gonorrhœa. Billings reported eight cases of chronic arthritis which were cured by the removal of the focus of infection. In two cases injections into rabbits of streptococci obtained from the foci caused a simple or multiple arthritis. In most of the cases reported in which marked improvement followed the removal of the focus of infection the focus was in the teeth or tonsils. In some cases improvement was noted in two or three weeks, but as a rule the joint symptoms did not disappear entirely before six or eight months.

Every case of chronic arthritis and acute arthritis should be treated on the presumption that it is due to an infection or to trauma. The history should be taken carefully and the patient subjected to a detailed physical examination. Usually routine blood and urine examinations are necessary, and in many cases an X-ray examination in addition. Special attention should be paid to the history of Neisserian infection, the time of the infection, its duration, and the nature of the treatment given. In the physical examination particular attention should be paid to the teeth, nasal sinuses, tonsils, and genito-urinary tract.

In many cases a number of foci have been found, such as a chronic prostatitis and chronic tonsillitis, or a chronic prostatitis and a chronic root abscess or pyorrhœa.

After proper treatment 42.3 per cent of the cases in which the genito-urinary tract was the source of infection have shown definite improvement.

It is of interest to note that in over 54 per cent of the cases in which the teeth were the foci, the condition developed between the ages of 40 and 60 years. Of these, 61.5 per cent showed definite improvement. In 15.3 per cent there was no improvement.

Of seven cases in which tonsillectomy was performed, there was marked improvement in four.

The article is summarized as follows:

1. Fifty per cent of cases of chronic arthritis treated by the removal of foci of infection showed definite improvement.

2. The most striking results were obtained when the focus was in the genito-urinary tract. Very

rapid recovery occurred in cases in which the teeth were the focus of infection.

3. Removal of the tonsils in a few cases was followed shortly by the disappearance of pain and later by the return of function to the injured joint.

J. J. KURLANDER.

**Molesworth, H. W. L.:** *A Clinical Study of Infections of the Hand.* *Lancet*, 1920, cxcviii, 1035.

The author reviews 168 cases of infections of the hand in working people and shows the uniformly satisfactory results which are obtainable by early and judicious surgical intervention.

Fluctuation as an indication of the presence of pus should not be awaited. The point of maximum tenderness is most valuable in the determination of the site of suppuration. Wide and ample incision for free drainage reduces to a minimum the time of disability and the danger of serious complications.

Gas anæsthesia is necessary for efficient treatment and a tourniquet is an additional convenience as it allows careful exploration in a bloodless field.

Abscess on the palmar aspect of the hands and fingers was responsible for 50 per cent of the cases of suppurative tenosynovitis in the series reviewed. In such cases the sheath should be opened to its full length, the portion over the joint being left intact. If the tendon is a dull yellow, excision is indicated. The proximal end of the tendon should first be stitched to the periosteum of the proximal phalanx to prevent retraction upward and the formation of a secondary abscess. In the after-care it is important to move the fingers daily.

The treatment of bone and joint infections is unsatisfactory as 5 of every 17 cases eventually require amputation. These infections are always secondary and the result of spreading suppuration which at first may be treated very easily and satisfactorily.

The author rightly lays claim to originality in the view that palmar abscess is the most common cause of tenosynovitis and that the method of securing the proximal end of the tendon to the proximal phalanx before excising it is an additional and useful surgical procedure.

A. C. JOHNSON.

**Bier, A.:** *Neoarthrooses, Especially Those of the Knee Joint* (Ueber Nearthrosen, besonders ueber solche des Kniegelenks). *Zentralbl. f. Chir.*, 1920, xlvii, 2.

The feasibility of any operative method for the formation of a neoarthrosis is best tested in the knee joint. Even after Helferich's method—the interposition of a soft tissue flap between the ends of the bone—a mucous membrane sac is formed by liquefaction of the transplant. Helferich's method is very complicated in the foot and knee joint. The operative field must remain sterile, and careful attention is necessary in the after-treatment.

Other more simple methods are those in which the cavity is filled with blood, serum, normal salt

solution, or sterilized gelatin. The results of these methods, however, are not at all constant or certain. As in the Helferich method, the danger of infection is great, especially if the resected joint is placed in flexion, which is absolutely necessary to obtain good function. The danger may be ameliorated somewhat by cleansing the cavity with a 5 per cent solution of tincture of iodine.

The after-treatment should consist of flexion for from ten to fourteen days, extension for three or four days, and then flexion during the night and extension during the day followed by active motion. The patient should be allowed up after four to six weeks with or without the application of the Scharnier apparatus.

Very old ankylosis is not a contra-indication to the operation. KLOSE (Z).

**Peltesohn, S.: A Contribution to the Knowledge of Congenital Foot Deformities** (Beitraege zur Kenntnis der angeborenen Fussverbildungen). *Berl. klin. Wchnschr.*, 1920, lvii, III.

The author gained valuable information regarding the etiology of congenital foot deformities during the war. This paper deals with a case of metatarsus varus congenitus and a case of a special type of metatarsus abductus. The X-ray demonstrated spina bifida occulta in both. This condition was present also in 6 other cases of congenital foot deformity.

During his investigation the author gained the impression that spina bifida occulta is present in the majority of cases of congenital club-foot. His conclusions are as follows: Spina bifida occulta associated with congenital foot deformities and especially with congenital club-foot is much more common than has been believed hitherto. Whether there is any more definite relationship between the two conditions can be determined only by further investigations on large numbers of cases. In cases of both acquired and congenital foot deformities in which the etiology is doubtful the demonstration of a spina bifida occulta by means of the X-ray may be the deciding factor. BELA DOLLINGER (Z).

## FRACTURES AND DISLOCATIONS

**Girdlestone, G. R.: The Care of Crippled Children.** *Brit. M. J.*, 1920, i, 697.

A study of 1,001 cripples more than 16 years of age made by the Birmingham Education Committee demonstrated that only 111 were able to perform remunerative work at home and 531 were unable to do any remunerative work whatever.

A plan is suggested whereby cripples may be cared for in hospital schools erected and maintained under government supervision. The benefits derived from such a plan would be manifold. Many children would be reached who, under the present system, are receiving little or no attention because of their lack of financial means or their remoteness from hospital advantages. A great number of cripples

who are confined in industrial homes, work-houses, or infirmaries, or are otherwise burdens upon the state and society, would be transformed into producers and thereby rendered useful assets to the state.

By such a plan a given territory would be divided into districts and in each district a "residential school" would be established in addition to the hospital school. Here children who are severely crippled or who live far from a school would be cared for. When discharged from the hospital such children would remain under the supervision of the orthopedic surgeon and continue to attend the school and workshops.

The author suggests that in England and Wales the plan can be carried out best through the co-operation of the Ministry of Health and the Board of Education. In London and other large cities each orthopedic hospital or general hospital with an orthopedic department should care for the children in its own section of the city and should have beds for crippled children from the country.

The types of cases to be cared for fall into three groups: (1) deformities, (2) paralyses, and (3) surgical tuberculosis and other affections of the bones and joints.

An ideal hospital school for crippled children should have open-air wards in the country and should be built on dry subsoil and near a main town. It should be affiliated with a good general hospital and equipped with a sufficient number of beds. The unit should be of manageable size, perhaps not over 200 beds, and should have offices in which the administrative end of the work may be cared for. In construction and design it should be semi-permanent and of the bungalow type.

Architectural plans for the erection of such a hospital, suggestions regarding its equipment and its maintenance under government supervision, and an estimate of expenditures necessary for its successful operation are given in detail.

T. D. MOORE.

**Rauenbusch: Conservative Treatment of Severe Gunshot Fractures** (Tratamiento conservador de las fracturas expuestas graves por armas de fuego). *Rev. de la Asoc. med. argent.*, 1919, xxxi, 606.

This article is based on the author's experience in the war zones of Poland, France, and Belgium. The treatment of the average case of gunshot fracture in which the patient does not react from shock was to shave the skin, cleanse the parts with gasoline, and iodize freely, under anaesthesia if necessary. Free incisions were sometimes made into the wound. All foreign bodies were removed. Bone fragments loose in the tissues were removed when free from periosteum, but if the periosteum was attached the fragments were left in place. Protruding spicules of bone were cut off, but large protruding portions were returned to normal apposition after disinfection. All damaged and hopelessly lacerated tissue was freely incised.



Conservative treatment then consisted of free drainage and immobilization by means of plaster casts. Double fenestrated and bracket casts were both employed routinely in large field hospitals in which soldiers arrived from twenty-four to forty-eight hours after the injury. Aluminum brackets were especially favored because it was possible to bend them easily into the required form.

With open treatment installed, wounds were cleansed two or three times daily with hydrogen peroxide. Cases in which joints also were involved and which reached the hospital within twenty-four hours after injury were treated by arthrotomy and the removal of foreign bodies from the articular cavities. This was followed by the injection of a mixture of phenol, camphor, and alcohol into the joint cavity, closure of the joint, and the application of a cast.

Close watch of the patient's progress is necessary in order that amputation may be performed quickly for such indications as gangrene, secondary hemorrhage, extensive cellulitis, and profuse and prolonged supuration.

The greater portion of the article is made up of case histories which are illustrated with photographs, radiographs, and diagrams of the lesions discussed.

W. R. MEEKER.

**Fleuster: The Treatment of Fractures with the Schoenmann Clamp; Double Clamp Extension** (Frakturenbehandlung mit der Schoenmannschen Zange; Doppelzangenextension). *Berl. klin. Wchnschr.*, 1920, lvii, 192.

In the treatment of fractures at the Cologne clinic the adhesive tape method of extension and the nail extension method have been entirely superseded by the use of the Schoenmann clamp. A set screw regulates the depth to which the points of the clamp are to penetrate the bone. The method is simple and there is no danger of infection.

To avoid lateral displacement double extension above and below is necessary in cases of fracture of the forearm and leg. The knee or elbow is slightly flexed and the teeth of the clamp are applied in the one case at the malleoli or calcaneus and the condyles of the tibia or femur, and in the other case at the condyles of the humerus and the styloid process of the ulna and radius. After some consolidation has taken place a circular plaster of Paris cast is applied.

BRUENING (Z).

**Hey-Groves, E. W.: The Application of Bone-Grafting in the Treatment of Fractures.** *Lancet*, 1920, cxcviii, 1048.

Although the author advocates the use of bone grafts in properly selected cases, he warns against the present tendency to outrun discretion as it may discredit an operation of unquestionable merit. Axial traction and early motion of joints give good functional results in simple fractures. The tendency toward the use of sliding inlay grafts and prolonged fixation of joints in plaster is to be regretted.

Intramedullary bone pegs, which are from 1 to 2 in. in length and from  $\frac{1}{8}$  to  $\frac{1}{2}$  in. in thickness, have a small boss in the center to prevent their slipping too far into one fragment. This has given great satisfaction when: (1) the case is clean, (2) there is no comminution, and (3) the fracture is nearly transverse.

Autogenous grafts are preferable, although ox bone perforated by drill holes to facilitate vascularization may be used. They seem to be able to survive under septic conditions. It is important to correct deformity before the graft is inserted and firmly fixed.

Three types of tissue are encountered in the bed into which the graft is inserted: (1) latent septic scar tissue, (2) atrophy of bone ends, and (3) sclerosis of bone ends.

Operations for non-union must frequently be done in several stages: (1) the replacement of adherent or thin cutaneous scars by pedicled skin flaps, and (2) the excision of deep scar tissue and unhealthy bone ends, followed in from two to six months by the bone grafting operation. Different techniques and methods of application may be used in applying grafts to long bones.

H. W. MEYERDING.

**Jones, E.: The Operative Treatment of Irreducible Paralytic Dislocation of the Hip Joint.** *J. Orthop. Surg.*, 1920, ii, 183.

The author describes his modification of the Albee operation on dislocated hips when the acetabulum is shallow and the hip will not stay in place after reasonable trial by the bloodless method.

The operation consists of the turning down of a superior curved lip of bone to overhang the deficient acetabulum and maintain the reduced femoral head. The position of the overhanging lip or rim is maintained by tibial bone grafts.

Jones reports a very interesting and instructive case, that of a student 18 years of age who had had infantile paralysis when 18 months old. There was an extreme flexion adduction deformity of the hip with  $9\frac{1}{4}$  in. of apparent shortening. The great trochanter was 4 in. above Nelaton's line. The X-ray showed a high iliac dislocation with moderate coxa valga and practically no acetabulum; malformation of the femoral head; and marked atrophy of the shaft and right pelvis. The technique of operation was as follows:

With the patient on the Hawley table direct skeletal traction was obtained by a Steinmann pin inserted above the condyles of the femur. Two metal chains connected the pin and the Hawley foot-piece. The traction was regulated by an assistant. Flexion adduction deformity had been corrected previously by open tenotomies of the iliopsoas and adductors and extensor femoris. The Smith-Peterson incision gave excellent exposure of the ilium and acetabulum. The iliac incision was curved to 3 in. below the trochanter and that bone was removed with a wide osteotome. The capsule

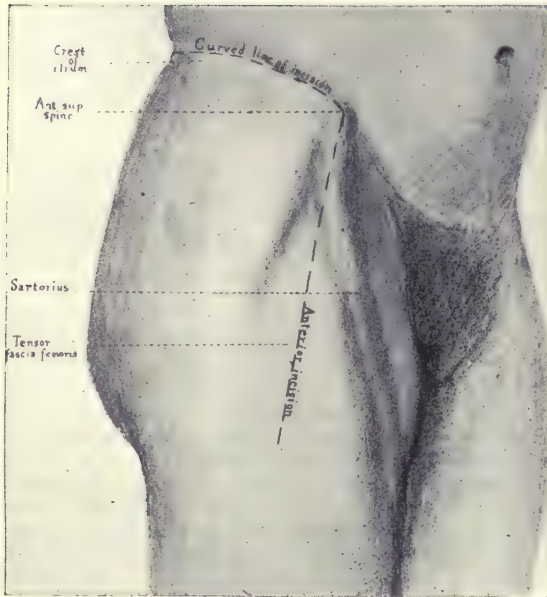


Fig. 1. Line of incision for subperiosteal approach to the hip joint.

was split longitudinally and the head of femur exposed and remodeled, care being taken not to remove any of the weight-bearing cartilage. The rudimentary acetabulum was found filled with fat and

areolar tissues. This was removed, together with a thin fibrous cord, the remains of the teres ligament. The joint capsule was represented by an extremely thin, overstretched membrane which was peritoneum-like in thickness. The acetabulum barely admitted the tips of the first two fingers (Fig. 2). Skeletal traction was very carefully obtained at intervals, and the pulsation of the femoral artery was watched.

The head of the femur was gradually brought down to the level of the acetabulum. There was no evidence whatever of circulatory disturbance although the traction seemed extreme. Traction followed by equally gradual abduction engaged the head at the edge of the acetabulum. With a chisel, a 4-in. curved lip of bone was turned down and outward approximately 1 in. above and behind the acetabulum to form a curved roof about 1 in. in width and thickness (Fig. 3). A tibial graft 3 in. long and  $\frac{3}{4}$  in. wide was obtained from the right tibia and cut in half. The transplants were shaped with the motor saw and inserted above and behind the newly-formed acetabular roof (Figs. 4, 5, 6). The trochanter was then replaced and held with a kangaroo suture, and the relaxed capsule reefed with two similar mattress sutures. The soft tissues were closed with chromic catgut without drainage. The Steinmann pin was removed and a long spica applied from the toes to the nipple-line in 30 degrees abduction.

The convalescence was uneventful. The plaster spica was changed to a short spica at the eighth week. At the end of the sixteenth week all fixation was



Fig. 2.

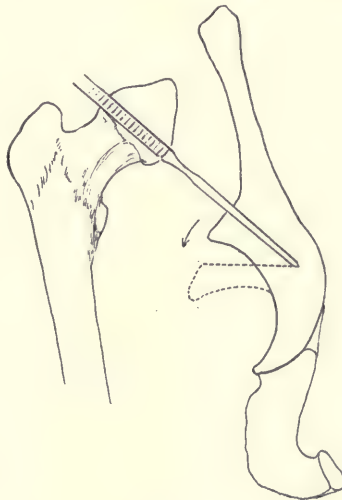


Fig. 3.



Fig. 4.

Fig. 2. Schematic drawing of a persistent paralytic dislocation. Note the overstretched atrophied capsule and trochanteric muscles, the deficient atrophied acetabulum, the distorted femoral head. The dotted line indicates the approximate depth of the normal acetabulum.

Fig. 3. Turning down a superior bony lip to form an efficient acetabular roof.

Fig. 4. The roof turned down and a notch prepared for the tibial transplant.



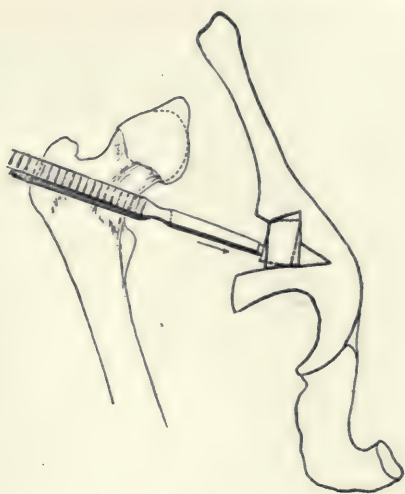


Fig. 5.

Fig. 5. The tibial transplant being forced into place. The head of the femur is remodeled.



Fig. 6.

Fig. 6. The dislocation reduced and maintained by the now efficient acetabulum.

removed and massage, muscle training, and active motion were begun. Seven months after the operation there was 70 degrees of voluntary flexion. The patient walked with a cane and wore a high shoe to compensate for an atrophic shortening of only  $4\frac{1}{4}$  in. On September 20, 1919, two years after the operation, the patient reported by letter that he had entered an agricultural college, was able to run a tractor, and walked without a cane.

The author draws the following conclusions:

1. In certain cases of so-called irreducible paralytic dislocations of the hip, correction of the deformity with function can be obtained.

2. Hoffa's belief, based on experiments on the cadaver, that rupture of the blood vessels and nerves must occur in long-standing cases before surgical shortening can be obtained does not hold true in the living.

3. Muscles in paralytic hips which by their contractures are able to perpetuate a dislocation at the hip are able also to perform function if the dislocation can be reduced. Therefore arthrodesis should not be the method of choice except in cases of flail hips.

PHILIP LEWIN.

**Foldes, D.: Fractures of the Patella, Os Calcis, and Olecranon Treated by Fischer's Apparatus.** *Surg., Gynec. & Obst.*, 1920, XXX, 510.

Fischer's method for the treatment of fractures of the patella can be applied as a conservative or as a postoperative method of treatment.

When used as a conservative method it solves the problem of the approximation of the fragments

and the mobilization of the joint without causing diastasis when the joint is flexed.

When used postoperatively it relieves the tension on the sutures by overcoming the retraction of the quadriceps muscle, permits the patient to be out of bed, and prevents separation of the fragments during mobilization.

The apparatus consists of a steel plate with hooks at each end. The traction can be increased either by bending the steel plates or by using a greater number of plates.

A piece of hard wood, 30 cm. long, with a pulley at each end, may be substituted for the steel plate

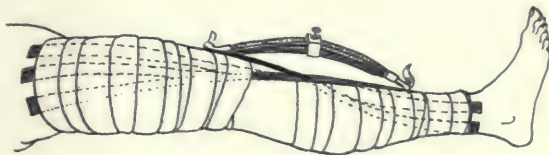


Fig. 1. Steel apparatus in place.

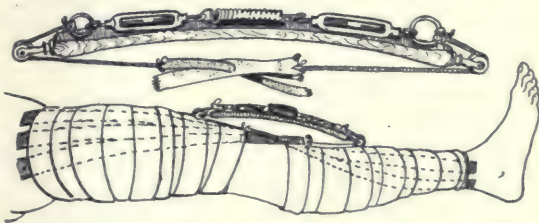


Fig. 2. Wooden apparatus.

apparatus. Springs and turnbuckles are used to hold together the ends of the cord carried over the pulleys.

Adhesive traction splints are placed on the anterior surface of the thigh and leg. A hole is cut in the upper wider adhesive and the lower adhesive splint is pulled through this opening. The ends of the adhesive strips are hooked to the ends of the steel apparatus. When the wooden apparatus is employed a small piece of wood is inserted at the end of the adhesive strip and a cord is tied to it. This cord is carried over the pulleys and attached to the turnbuckles.

The traction is constant and can be accurately adjusted. The apparatus may be used for fractures of the patella, olecranon, and os calcis, and in any case in which traction is necessary to overcome the separation of bone fragments.

#### **SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.**

**Grégoire, R.: Obturation of Bone Cavities by Muscle Strips** (Obturation des cavités osseuses par lambeaux musculaires). *J. de chir.*, 1919-20, XV, 593.

Grégoire gives the clinical histories of three cases in which he used muscle strips to fill bone cavities. These were cases of old, extensive cavities secondary to an osteomyelitic process, and bone lesions which were surrounded by a thick muscle sheath. Such cavities are the most difficult to close by epidermization, but in the cases reported closure was obtained in from twenty-one to thirty-five days.

A properly cut muscle strip holds well and without traction in a cavity. The war has disproved the theory that the removal of a strip of muscle compromises the functioning of a limb. It is not known whether the muscle strip degenerates into fibrous tissue or undergoes osseous transformation, but the cavity fills and suppuration ceases, which is the object sought in the treatment.

The cavity should be cleared of sequestra, curetted, trimmed, and filled at the one intervention. The bone should be trephined sufficiently to permit the removal of all the sequestra and the filling of the recesses. Two radiographs should be taken at perpendicular axes in order that the site of the cavity in relation to the thickness of the bone may be determined exactly. The muscle strip should be cut long so that it will fit into the cavity easily without traction and its root should be large so that it will have sufficient nourishment. The fact that retraction will occur must be taken into account. As a rule the patient will be able to execute all movements and cicatrization will be complete at the end of four or five weeks. W. A. BRENNAN.

**Massart, R.: The Surgical Treatment of Definite Radial Paralysis by Tenoplasty** (Traitement chirurgical des paralysies radiales définitives par la ténoplastie). *J. de chir.*, 1919-20, XV, 601.

The literature shows that during the war surgeons were not disposed to use tenoplasty in the treat-

ment of definite paralysis. Before the war this method was widely employed in the treatment of infantile paralysis, but paralysis due to nerve section was rarely treated by either myoplasty or tenoplasty. In Germany, however, Perthes reported 26 such cases in which excellent results were obtained by tenoplasty.

Tendon transplantation is indicated: (1) in cases of old injuries in which no nerve operation has been done; (2) in cases of old injuries in which neurorraphy has not been effective; and (3) in cases of recent injuries when the nerve lesion is too extensive to be followed by regeneration. The first object of operation is to re-establish the extension of the carpals and metacarpals and the extension of the first phalanx on the metacarpal. This having been realized, the extension of the second and third phalanges will be facilitated by the interosseous and lumbricales muscles.

The author reviews the various techniques which have been employed in the treatment of paralysis of the radial nerve, giving special consideration to those of Murphy, Berger and Banzet, Byrne, Jones, Henry, and Perthes.

Massart's technique associates a shortening of the extensor tendons with transplantation of the tendons of the great palmar, the lesser palmar, and anterior ulnar, brought together *en fronde* on the extensors of the fingers and thumb. The hand, in forced supination, is placed flat on a small table and a horse-shoe incision is made below the fold of flexion of the wrist, care being taken to avoid cutting the lesser palmar and also the anomalous arteries which are frequently found in this region. The great palmar is freed at the level of its insertion at the metacarpal base, the anterior ulnar being freed at the same time. After the liberation of the three tendons the hand is turned so that the dorsal surface is upward. A long dorsal incision is then made descending along the back of the hand as far as the middle third of the metacarpals and exposing the dorsal ligament of the carpal and the extensor tendons where they branch from the dorsal ligaments. The incised strip is then turned back and the tendon shortening continued. The most simple method is a plication of all the common extensor tendons and those belonging to the fifth and second digits.

When these tendons are shortened, those previously sectioned are sought on the anterior side and brought to the posterior surface, beginning with the anterior ulnar. With a Kocher forceps passing between the ulnar and the tendon of the posterior ulnar muscle the anterior ulnar tendon is drawn through to the posterior surface and sutured to the three shortened internal tendons. Similar manœuvres are executed with the other tendons. During the entire operation extension of the hand and first finger is maintained by an assistant.

A wire splint is used. Careful mobilization may be permitted by the eighth day. An important factor in the treatment is massage.

While the tendon transplantation described does not restore normal movement and suppleness, it



makes it possible to use the hand. It allows movement of the small articulations of the fingers and prevents stiffness, ankylosis, and permanent retraction. When it is well done the hand functions well without the use of any prosthetic apparatus.

W. A. BRENNAN.

**Dujarier, C.: The Treatment of Pseudarthroses of the Leg** (*Traitement des pseudarthroses de jambe*). *J. de chir.*, 1920, xvi, 31.

In 130 cases of pseudarthrosis operated upon by Dujarier there were 24 cases in which the leg was involved. Only 3 were cases of closed fracture without loss of substance. In the great majority the loss of bone amounted to 5 or 6 cm., and in some instances was as much as 10 cm.

In the treatment of pseudarthroses without loss of substance reduction with leverage and coaptation of the fragments is sufficient, but in many cases considerable traction must be applied. Metallic plates have not been used in securing coaptation as clips have been found adequate.

When there is extensive loss of substance grafting is necessary. Dujarier used grafts according to the Albee technique in 12 cases. The graft is generally cut in the vicinity of the lesion to be repaired. In some cases more than one piece of bone may be necessary. It does not seem to make any difference whether the periosteum is removed with the bone or not.

Suppuration did not occur in any of Dujarier's 12 cases and satisfactory consolidation was obtained in all except 1. In 3 cases the graft fractured five or six months after the operation. The fracture was always in that part of the graft which corresponded to the area of loss of substance. Grafts seem to be especially fragile after they have been inserted for this length of time. Reconsolidation was obtained in these cases by continued treatment. It is possible that the fractures may have been due to the fact that the grafts were taken from bones affected by slight osteoporosis.

Of the 12 cases operated upon by Albee's method complete consolidation was obtained in 10. In 6 cases of slight loss of substance in which a graft was inserted according to a technique other than that used by Albee consolidation resulted in 5 and suppuration in 1. A graft with periosteum was used successfully in 3 cases.

In the 24 cases fractures due to suppuration occurred in 2, successful results were obtained in 20, and 2 cases are still under treatment. In most instances the consolidation was obtained in from two to four months.

W. A. BRENNAN.

**Bastos Ansart, M.: The Treatment of Pseudarthrosis of the Neck of the Femur by Albee's Method** (*Sobre el tratamiento de las pseudartrosis del cuello del fémur por el método de Albée*). *Prog. de la clin.*, Madrid, 1920, viii, 146.

In all pseudarthroses, and especially those of the neck of the femur, the current method of treatment is

the application of osseous transplants. The use of bone grafts obtained from the same patient is more rational from a physiological standpoint than the employment of ligatures, screws, or spikes of ivory or other materials. The osseous transplant continues to live, so that in addition to giving mechanical support it serves the physiological function of regeneration. These principles, together with the improved technique of Albee, have greatly simplified the operation and improved the ultimate results.

The author's adaptation of the Albee method is as follows:

The upper extremity is perforated with a special variety of bone drill, beginning opposite the base of the neck and extending medially and upward within the neck. A bone graft is then taken from the tibia by means of a twin saw and dressed with a die-stock the same size as the drill which has been used so that it exactly fits the channel in the neck of the femur. This plug may be inserted with perfect adjustment and without the use of force.

The causes of non-union in fractures of the neck are chiefly physiological, i.e., low vitality of the fragments and malposition of the fractured surfaces. The Albee method brings about ideal coaptation of the fracture surfaces.

The author does not claim to have improved the original technique nor to have devised any important additional steps, but calls attention to these points which he regards as of special value:

1. Placing the leg previously in internal rotation and maximal abduction so that apposition of the fragments may be obtained most easily. As a rule a plaster cast should be applied afterward to sustain the parts in this position.

2. Inserting the graft exactly in the edge of the neck, low down at the superior end of the diaphysis, and directing it obliquely toward the center of the head or somewhat higher.

W. R. MEEKER.

## ORTHOPEDICS IN GENERAL

**Elmer, W. G.: The Operations We Have Found Most Satisfactory in the Orthopedic Department of the University of Pennsylvania.** *Pennsylvania M. J.*, 1920, xxiii, 394.

The family physician is the first one to see and recognize an acute illness which, if neglected, may lead to crippling deformity. He is also the first to perceive congenital abnormalities which require early attention by the orthopedic surgeon.

Cases of tuberculosis of the hip, knee, ankle, tarsus, shoulder, and elbow are usually not operated upon. In some cases aspiration or incision and drainage is indicated, but usually the condition is treated by fixation and rest of the diseased part. The principal objects of treatment are the prevention of crippling deformity during repair and maximum function after cure.

When the completely separated head of the femur acts as a foreign body in the joint it is best to remove it.

If seen and recognized early, joint tuberculosis in children can be cured in less than a year, but when the destructive processes are far advanced, a child cannot be pronounced definitely cured before about three years.

Tuberculosis of the spine is treated in two ways: (1) rest in bed on a Bradford frame and Buck's extension followed by the application of a plaster of Paris jacket and a spine brace; and (2) operation. The operative method consists of the insertion of a bone graft from the tibia into the spine and the use of a spine brace for about one year. Children under 8 years of age are not treated by operation.

The advantages of the use of a bone graft is that it not only prevents a kyphosis from growing worse, but may cause it to disappear entirely as the graft is taken from the diaphysis of the tibia and grows very slowly in length. The arches of the vertebræ, being unaffected by the disease, grow normally, and the growth being anterior to the bone graft, the kyphos gradually straightens.

Infantile paralysis is treated early for the prevention of deformity. If deformity has already resulted the treatment must consist of correction and fixation in the corrected position. This is accomplished by tenotomy, tendon transplantation, plastic tendon operations, arthrodesis, etc.

As a rule reconstructive operations are not undertaken until four years after the initial illness. Arthrodesis is not done until the child is 8 years old. The use of artificial tendons and ligaments of silk has been found less satisfactory than other methods of treatment.

The author believes that more can be accomplished by operations on the muscles than by operations on nerve trunks.

In congenital dislocation of the hip the best method of reduction is that which was devised by Davis.

Congenital and acquired wry neck has been treated by open operation, the sternal or clavicular portion of the sternomastoid muscle or both being divided as the case requires. The head and trunk are enclosed in plaster with over-correction. The child is allowed out of bed the next day and the plaster is removed in three weeks.

Knock-knees and bow-legs are treated by osteotomy if the child is over 4 years of age, and by braces if it is less than 4 years of age.

Hallux valgus is treated by removing a wedge of bone from the inner side of the first metatarsal bone just behind the head and doing a subcutaneous tenotomy of the extensor proprius hallucis.

Cases of slipping internal semilunar cartilage of the knee are treated by the removal of the cartilage through a small vertical incision between the patellar tendon and internal condyle with the knee flexed over the end of the operating table.

Acute epiphysitis and acute osteomyelitis in children should be operated upon as soon as possible. An incision and one or more trephined open-

ings into the marrow cavity or epiphysis should be made.

Arthroplasty is performed to restore mobile function to an ankylosed joint. The operation is favored for joints which have become ankylosed in poor or deformed positions. Joints which have been the seat of tuberculosis and those which are ankylosed in a moderately favorable position for function should not be operated upon.

Congenital club-foot which has been neglected until the child is 8 or 10 years old is treated by tenotomy of the shortened tendons and forcible correction of the bony deformity by means of a mechanical device causing upward pressure upon the ball and heel of the foot and downward pressure upon the dorsum.

D. H. LEVINthal.

**Marshall, H. W.: The Use and Abuse of Mechanical Supports in Orthopedic Conditions.** Boston M. & S. J., 1920, clxxxii, 497.

All mechanical supports are reliable and effective when properly used, but most ineffective when improperly used or when worn for too short or too long a time. Also such orthopedic measures as massage, manipulation, baking, early passive motion, etc., are of inestimable value when properly handled, but disproportionate use of any single method to the exclusion of others is bad practice.

Braces should not be condemned dogmatically because of their limitations; their apparent inconveniences should not always be regarded as a sufficient reason for discarding them. Metal arch supports, for instance, are of value in their place, but allowing them to be worn too long is a fault as foot exercises, etc., must be used later. Sprains of the ankles, knees, and elbows must be protected and motion properly limited.

Industrial accident cases present peculiarities of their own because the injured workman drawing compensation differs from the man not drawing compensation. In such cases, especially, the physician must guard against the patient's wearing apparatus too long. Complicated appliances cannot be used with as much benefit as those which are more simple as in the patient's opinion the discomfort outweighs all the mechanical advantages. Baking and massage may be employed much more successfully. By careful management patients considered to have total permanent disabilities may sometimes be transformed into useful wage-earners. Braces may be condemned by their wearers and soon discarded because they are uncomfortable, but in the long run may prove much cheaper and more quickly effective than a series of painful manipulations.

The requirements of the individual case are always to be considered, and in the final analysis the best result comes from the successful combination of protective treatment and operative and manipulative surgery.

In conclusion the author reports several cases which illustrate his contentions. R. G. PACKARD.



**Fromme, A.: The Cause of Growth Deformities** (Die Ursache der Wachstumsdeformitäten). *Deutsche med. Wchnschr.*, 1920, xlvii, 169.

The study of cases of late rickets which was endemic last winter and in which numerous deformities such as knock-knees (14 per cent of the cases), bow-legs (13 per cent), and coxa valga were observed, has brought the author to the conclusion that the primary cause is to be found in a pathologic change of the bones. The secondary growth changes, however, he attempts to explain by a theory which will be applicable to all disturbances of growth.

Such changes he believes are induced by a rapid increase in the body weight which is too great for the weight-bearing capacity of the bones, especially those of the lower extremities. The deformities occur most commonly at the time of the greatest growth, i.e., during adolescence, as during this period the growing zone is broadest because of hypertrophy of the epiphyseal cartilage and therefore is most seriously influenced by trauma. This predisposition to traumatic influences is increased especially by rickets and late rickets. As a result of uniform compression of the growing zone the longitudinal growth is retarded and the joint areas are broadened out. Then, as a result of unilateral injury, deformity occurs.

Osteochondritis, particularly the osteochondritis coxae juvenilis, and the formation of joint bodies during the growing period are also explained by this theory. STETTNER (Z).

**Magnus, G.: The Treatment of Rachitic Deformities in General Practice** (Die Behandlung der rachitischen Verkrümmungen in der allgemeinen Praxis). *Therap. Halbmonatsschr.*, 1920, xxxiv, 4.

Orthopedic treatment of rachitis should not be begun before the disease itself has terminated, i.e., not before the fourth year of life. By the method described the bone to be treated is intentionally rendered atrophic, poor in calcium, and soft by the application of a plaster cast. The legs in their abnormal position are encased in plaster for five or six weeks. After the removal of the cast the curved bones are straightened out manually and the extremities again placed in casts for another period of six weeks. The second cast is made heavy purposely so that the atrophy will disappear.

Thirty cases were treated by this method at the Marburg clinic. B. VALENTIN (Z).

**Lovett, R. W.: The Tripod Method of Walking with Crutches as Applicable to Patients with Complete Paralysis of the Lower Extremities.** *J. Am. M. Ass.*, 1920, lxxiv, 1306.

Complete paralysis of both lower extremities is not necessarily a bar to all forms of ambulatory activity. If a cadaver is stood upright, the knees flex and the body crumples to the floor, but if the knees are held rigid by splints and it is steadied at the pelvis, the trunk falls forward. Similarly in the case of a patient with flaccid paralysis whose knees are fixed in the extended position the erect position can be maintained without crutches only if the gluteus maximus is able to prevent flexion of the trunk. Hence the muscles which are most important in maintaining the erect position are the quadriceps femoris and the gluteus maximus.

If in case of complete paralysis of the lower extremities the knees are kept from flexing by simple splints such as calipers, the loss of the gluteus maximus can be compensated by using crutches in the author's tripod walking. The crutches are placed apart and well forward to form the two anterior points of the tripod, while the third point of the tripod is formed by the patient's body which is inclined forward at its upper end with the feet well behind. This position is stable for two reasons: the base of support is a large triangle, and the body is stable in the over-extended position because hyperextension of the hips is checked by the "Y" ligament of Bigelow and the center of gravity falls in front of the hip joints and keeps them extended and firm.

Now, provided there are no contraction deformities, the patient can easily stand unsupported. He must be taught confidence to re-learn the sense of upright equilibrium. Walking is accomplished by placing the crutches forward one at a time and then jerking the feet forward together by a body movement, or, if there is slight power in the iliopsoas, by advancing one limb at a time.

The best knee splint is the simple Thomas caliper splint consisting of two uprights shaped to the leg, which pass down from the groin and are bent at right angles into the heel of the shoe, with or without a stop-joint at the knee. No pelvic band is needed.

Lovett reports several cases, including cases of poliomyelitis and fractures of the spine.

R. G. PACKARD.

## SURGERY OF THE SPINAL COLUMN AND CORD

**Meyerding, H. W.: The Treatment of Tuberculosis of the Spine.** *Minnesota Med.*, 1920, iii, 245.

Of 405 patients with Pott's disease observed at the Mayo Clinic from September, 1912, to January, 1919, 100 were operated on by a modified Albee bone-grafting method.

Nine of these patients were between 1 and 10 years of age; 5, between 11 and 20 years; 56, between 21 and 30 years; 19, between 31 and 40 years; 7, between 41 and 50 years; and 4, between 51 and 60 years. The average age was 25 years.

Sixty-five per cent were males and 35 per cent females. Symptoms had been present in 8 cases for



less than one year; in 24, for from one to two years; in 21, for from two to three years; in 13, for from three to four years; in 10, for from four to five years; and in 1, for nineteen years.

Twenty-two patients gave a history of trauma to the area involved; 78 did not mention an injury. Twenty-seven had had tuberculosis in other parts of the body such as the lungs, joints, testicles, peritoneum, etc., before symptoms were manifested in the spine. Symptoms of paraplegia were present in 7 cases and were not considered contra-indications to operation.

The disease was located in the high dorsal region in 2 cases; in the mid-dorsal region in 14; in the low dorsal region in 27; in the dorsolumbar region in 11; and in the lumbar region in 46. Eight patients had definite abscesses; 9, suppurative sinuses; and 78, definite deformity. Previous treatment, which consisted of the application of casts and braces, had been unsatisfactory. In 3 of the cases bone grafting had been done elsewhere.

Early diagnosis and careful prolonged care of the patient under competent supervision are essential for a favorable outcome when tuberculosis attacks the spine. Although conservative treatment has given a fair percentage of favorable results, a definite group of cases remains in which the surgical fusions of Hibbs and Albee have shortened the period of disability, prevented further deformity, and given more certain relief than conservative measures. Thus these operations have been placed on a sound surgical foundation in the armamentarium of treatment.

The fact that the spinous processes and laminae are seldom involved in tuberculous spondylitis makes the fusion operations practical. It is to be remembered, however, that the disease process is merely immobilized by such surgery and the deformity remains; that the patient is tuberculous; and that there is probably a focus in another part of the body. Nature is slow to produce ankylosis, and external splinting to immobilize completely is impossible. Surgery, on the other hand, gives the best fixation in a comparatively short time.

The most favorable results are to be obtained by a proper selection of patients to be operated on and continuance of the conservative treatment after operation until, in the judgment of the surgeon, the disease process has been arrested. The bone graft used in the Clinic cases was curved to fit the deformity. Recumbency, rest, and general physical hygiene are essential in all instances. Patients under 5 years of age and adults who present complications, such as suppurating sinuses and pulmonary tuberculosis, should be treated by means of the Bradford frame for a period usually of from six months to one year, or until the disease has been arrested. This should be followed by the use of plaster of Paris casts applied so as to relieve the diseased area of weight-bearing and give the spine as much fixation in extension as is possible. Still later a Taylor spinal brace should be applied. In some instances, when

the general condition has improved but the symptoms of spinal disease remain unarrested after such treatment, a bone-graft operation may be resorted to with benefit. The Calot jacket and suspension jury masts are useful, especially when the disease attacks the upper dorsal and cervical spine. Many patients have been treated by casts and braces which fail to support the weight above the diseased area. The effect of such apparatus is often more harmful than beneficial since they act as restrictors of respiration and add to the weight and discomfort of the already overburdened body. A properly applied jacket allows breathing space, hyperextends the spine, and supports the weight above the necrosed area. All braces should be applied under the supervision of the attending surgeon and never left to the bracermaker. While the latter may be proficient in the making of the brace, the principle and adjustment require a knowledge of the extent of the disease itself.

Recumbency is without doubt the most satisfactory aid to treatment. When the diagnosis is made early, fusion is induced surgically and reinforced later by some means of external fixation, and when general anti-tuberculosis treatment is adopted marked deformity and complication will soon become rare. The Rollier sunshine treatment should be urged and instituted while the patient is under control. Medication may be indicated when anæmia of a secondary nature is present. Usually, however, a nourishing diet, cod-liver oil, fresh air, and recumbency are sufficient. Inasmuch as the lesion in the spine is a local manifestation of a disease process which probably has had its origin in a primary focus in some other part of the body, the general hygienic care of the patient is of the first importance.

A rule with regard to the period of recumbency would be impractical, especially in conservative treatment, since the conditions as to activity, extent, and abscess complications vary greatly at the time the patients present themselves for treatment. It is somewhat difficult to decide when the patient should be allowed to get up after operation, and the judgment of the surgeon varies in different clinics. Usually the patient's relief from pain and desire to move are of value in the decision. When the temperature is normal he may be given permission to sit up after a properly fitted brace has been applied. Later an X-ray should be taken; the amount of calcification and union are of importance in determining the extent of repair. At the Mayo Clinic the period of recumbency and the time on the frame are determined by the patient's condition after repeated examinations; no definite time for conservative treatment is established. After the period of recumbency a cast is applied, and still later, a spinal brace. All the while the patient and his relatives are impressed with the importance of general care and especially of fresh air and sunshine (Rollier). All patients treated by recumbency should be kept in an institution long enough for the



parents or other relatives to be instructed regarding the method. In this way much better results are obtainable and the parent who is alarmed on seeing the child on the frame for the first time will later become a firm believer in the value of the procedure.

While the time of recumbency cannot be given definitely, a year will usually suffice, especially if hyperextension and heliotherapy are combined with fresh air and proper food and nursing. In surgical cases the time of recumbency is lessened; in most of the cases at the Mayo Clinic the patient is up and about with a cast or brace in six weeks. Care must be taken not to fracture or loosen the graft as during recumbency and when the patient is turned as well as when he is up and about the spine must be kept from rotation and flexion. Nurses are taught to turn the patient by rolling, the shoulder and thigh being grasped so as to prevent twisting of the spine. A well-fitted cast, split before operation and padded and re-applied immediately afterward, is the best means of obtaining fixation in bed. A stiff bed should be used, however, and the spring re-inforced with transverse boards. During the sixth week the brace is applied while the patient is in bed and he is allowed to become accustomed to the upright position on a back rest before he sits in a chair. Within the next few days he begins walking in most instances and is then cautioned against removing the brace unless he is recumbent.

It is obvious that the reported results vary according to the interpretation of what constitutes a cure. It is considered desirable to express the value of treatment in terms of improved and unimproved conditions. Although the deformity and even the evidence of psoas abscess remain, the patient should be considered as benefited by operation and is so reported in this series if he was relieved of pain and able to return to activity.

Eighty-six per cent of the patients in the series have been relieved of clinical symptoms. Three patients are unimproved; 3 have not been heard from. Eight patients have died since operation. These were:

1. A child, aged 4, who had had symptoms for two years, presented a kyphos, was operated on, and recovered sufficiently to attend school. Death due to tuberculous meningitis was reported eighteen months after the operation.

2. A woman, aged 26, who had had symptoms five years. This patient died of tuberculous peritonitis twenty-two months after operation. The postmortem examination showed the graft ankylosed and the spine healed.

3. A man, aged 51, who had had symptoms for two years. The cause and date of death were not given.

4. A woman, aged 26. Death was due to tuberculous peritonitis. The patient had been dismissed with a brace, apparently improved.

5. A man, aged 35, who had had symptoms for three years. Death was due to miliary tuberculosis, tuberculous adrenals, tuberculous spine, etc.

6. A man, aged 24, with symptoms of eighteen months' duration. Death occurred six months after operation; the cause is not known. A psoas abscess was present at the time of operation.

7. A man, aged 24 who had had symptoms for six years. Death occurred from pulmonary embolism the twelfth day after operation while the patient was still recumbent and as he was reaching out for a book.

8. A man, aged 39, whose condition was complicated by an old pulmonary tuberculosis and who had had spinal symptoms for one year. Death occurred from tuberculous meningitis thirteen days after the operation.

The following summary is given:

1. The fusion operations of Hibbs and Albee for tuberculosis of the spine have given a means of obtaining internal fixation which shortens recumbency, prevents further deformity, and tends to hasten healing.

2. The disease in the vertebral bodies is not eradicated by the fusion operations and relief of symptoms does not mean cure.

3. General anti-tuberculous measures are of primary importance and should be insisted on.

4. Recumbency and external fixation are still necessary adjuncts to successful treatment and should be carefully carried out.

5. Abscesses should be let alone unless they cause discomfort or pain or are secondarily infected, when they should be carefully aspirated and injected.

6. A primary focus, which may be determined in a small number of cases, indicates a general disease of which the spinal symptoms are manifestations.

7. Children under 5 years of age and adults with active pulmonary lesions and sinuses are poor risks.

8. Paraplegia does not contra-indicate operation for fixation.

**Climenko, H.: The Diagnosis of Spinal Cord Tumors. *Med. Rec.*, 1920, xcvi, 903.**

The diagnosis of spinal cord tumors is more of an art than a science. It is very difficult to tell with certainty whether one is dealing with a neoplasm, a systemic disease, or a multiple lesion of infectious origin. The diagnosis of the vertical level of a lesion of the cord is much easier than the diagnosis of its transverse involvement.

Bruns states that it is difficult, if not impossible, to differentiate between intradural and extradural tumors. For all practical purposes, however, a differentiation between an intramedullary and extramedullary tumor is sufficient.

The author reports three cases of spinal tumor, describing the operations and the patient's subsequent condition.

Pain which traveled along the distribution of a root was a symptom common to all three cases. In two of those in which the tumor was extramedullary the symptoms were those of irritation, while in the remaining case, in which the tumor was intra-

medullar, there was paresis due to destruction of cord tissue. In all three cases objective sensory changes were noted.

Tract symptoms are of no value in the level diagnosis. When spinal disease can be excluded

an increased paralysis and the Brown-Séquard syndrome following the removal of spinal fluid may be considered pathognomonic of cord tumor. In one of the author's cases syphilis was co-existent with the cord tumor.

I. E. BISHKOW.

## SURGERY OF THE NERVOUS SYSTEM

**Frazier, C. H.:** *The Present Status of Neurological Surgery.* *J.-Lancet*, 1920, n. s. xl, 237.

In this article the author reviews briefly the various procedures in the field of neurosurgery with comments based on his own experience.

The major operation for the treatment of trigeminal neuralgia, section of the sensory root of the Gasserian ganglion, may be characterized as the radical operation for the relief of major or epileptiform neuralgia. The routine performance of cerebral decompression in cases of cerebral contusion with or without basal fracture is unjustified. This operation should be reserved for cases which, during the first forty-eight hours, develop signs of increasing intracranial pressure of such degree as to threaten the function of the medullary centers. As far as the surgery of craniospinal injuries is concerned, the experiences of the military surgeon have made few contributions which are applicable to civil practice. For the repair of cranial defects, nothing has proved as uniformly satisfactory in every detail as a bone-filling graft of a thin shell of the outer table of the skull.

In his discussion of brain tumors the author states that a uniform classification should be adopted. Operation in these cases is too often delayed in the vain hope that the localization symptoms will enable the physician to confirm the diagnosis.

Frazier has been very much impressed with the possibilities of the X-ray and radium as supplements to surgical therapy. As regards nerve suture, he believes that in the final analysis only one method of restoring function remains—simple end-to-end suture of healthy nerve segments. The surgery of the spinal canal offers the chance for a higher percentage of permanent results than surgery of the brain. Section of the posterior roots as a means of relieving spasticity has not fulfilled the promise of its sponsors.

E. C. ROBITSHEK.

**Forrester-Brown, M.:** *Difficulties in the Diagnosis of Nerve Function.* *Brit. J. Surg.*, 1920, vii, 495.

The difficulties in the diagnosis of peripheral nerve lesions are discussed under the following heads: mentality, sensory difficulties, motor difficulties, abnormal nerve distribution, and the interpretation of electrical tests.

The examination is rendered more difficult in patients with mental inertia. Alertness and interest in the progress of the condition on the part of the patient hasten recovery.

Errors are less apt to occur in tests for sensory loss than in tests for motor loss. The limb should be warm and the patient's eyes closed during the examination. In testing for Tinel's sign the examiner should be sure that the tingling is not due to pressure on adjacent nerves.

The difficulties in diagnosing motor function are the greatest. Imitation of action by adjacent muscles, tension on fascia due to contraction of other muscle groups, and simultaneous contraction of all neighboring muscles make it difficult to determine whether or not the muscle tested is functioning. The author enumerates in detail conditions in the upper and lower extremities in which simulated muscle action is apt to occur.

In cases of abnormal nerve distribution a correct diagnosis before operation is impossible. The author cites three cases in which the median nerve supplied the ulnar muscles and one case in which the ulnar nerve supplied the median muscles.

Electrical examinations are important and must be done carefully. Since electrical reactions are difficult to obtain when the limb is cold it should be warmed before it is tested. The author has found that voluntary contraction in a paralyzed muscle returns before a faradic response can be obtained.

W. O. OTT.

**Pollock, L. J.:** *The Clinical Signs of Nerve Injury and Regeneration.* *Surg., Gynec. & Obst.*, 1920, xxx, 472.

To the author's knowledge there is no way in which the complete loss of function due to anatomical interruption of a nerve can be differentiated from that due to physiological interruption produced by compression, etc. In this article he defines the extent to which he believes the loss of function is of value in determining the severity of a peripheral nerve lesion. He believes the signs of regeneration of a nerve are the manifestations of the recovery of function. Among the latter are the return of sensation, both subjective and objective, the disappearance of the reaction of degeneration, an increase of tone, the disappearance of atrophy, and the return of motion.

The order in which the signs of regeneration appear has been given by Benisty as follows: (1) sensory regeneration consisting of pain when the skin is pinched, pain when the nerve is pressed below the lesion, formication on pressure of the nerve, and spontaneous aching in certain muscles; (2) the arrest of atrophy and the return of tonic-ity;



(3) in some cases, the return of faradic contractility; (4) the disappearance of objective sensory disturbances; and (5) voluntary movements.

Of these signs of regeneration, Pollock considers the disappearance of the reaction of degeneration, the return of objective sensibility in the isolated supply of a peripheral nerve, and the return of motion the only certain signs. The sensory and motor signs are the only constant signs. The others are suggestive, but not positive. The only objective sensory phenomenon which precedes the return of motion is pain when the isolated supply of the nerve is pinched. Sensibility to pain and to touch returns simultaneously.

E. C. ROBITSNEK.

**Stookey, B.: The Technique of Nerve Suture.** *J. Am. M. Ass.*, 1920, lxxiv, 1380.

On the utmost consideration of minute points of technique, more exacting perhaps than in almost any other field of surgery, may depend in a large measure the ultimate results of operations on the peripheral nerves.

By beginning the incision below and extending it upward much of the troublesome venous bleeding due to cutting of the veins as the incision is increased may be avoided. When possible, the superficial scar should be excised. The skin edges should be well undermined so as to include the fatty fascial layer and the fat brought with the skin edges into the new line of closure. The flaps should be prepared for closure before the search is made for the nerve. All bleeding points should be tied and the undermined edges packed with gauze. Unless this is done before the nerve is sutured the maneuvering that is necessary in the preparation of the flaps may derange the sutures.

When the deep scar is extensive it is best to identify the nerve both above and below in normal areas, selecting, if possible, points within the field which offer anatomical guides to the nerve which is sought.

In following the nerve from above downward and from below upward care must be taken to safeguard the delicate branches to adjacent muscles. The nerve may be retracted conveniently by passing moist tapes about 1 cm. wide around it and clamping the ends of the tapes with artery forceps. The weight of the forceps will usually be sufficient to hold the nerve in any desired position.

When a smooth bed for the nerve cannot be made, a small part of a muscle belly (not a cut and raw muscle surface) may be sutured so as to form a smooth surface by its fascial covering, or a fatty flap may be passed around or under the nerve. A free flap will tend to form additional scar and therefore should not be used. Care should be taken to suture the fatty flap to adjacent tissue on both sides of the nerve in order that constriction about the nerve may be prevented.

For stay sutures the author prefers No. 00 plain catgut. Fine silk is the best material for grafts and

epineural stitches in end-to-end suture. The silk should be very fine, preferably Corticelli No. AAA containing three strands. The strands should be untwisted, separated, waxed, and passed on fine curved or straight needles. All nerve sutures should be tied very carefully with the forceps.

The author's technique for end-to-end suture is described as follows:

A No. 00 plain catgut suture is placed at equal distances on each side of the nerve, more than the epineurium being included in the stitch. By these sutures the nerve in its deeper parts is brought together, hæmorrhage between the nerve ends is avoided (the amount of scar between the nerve ends being thereby diminished) and tension is taken off the finer epineural sutures. Axial rotation may also be prevented, particularly if the sutures are placed before the excision of the intervening nerve scar is completed.

Silk epineural sutures are then placed on the anterior surface between the two stay sutures and tied so that the epineural edge is everted. By reversing the two catgut stay sutures, i.e., by passing the one over and the other beneath, the under surface is readily brought into view and sutured in like manner.

Transposition of the nerve may permit the correction of defects which otherwise might prevent end-to-end suture. A nerve may be freed and raised out of its bed for quite a distance without interfering with its nutrition. In transposing, care must be taken to safeguard nerve twigs and prevent the formation of sharp angles and kinks.

A few cases of successful grafts have been reported in France. The technique of grafting is such that unless the operation is done by a surgeon with considerable practice the results may be disappointing. Success depends in a measure on the accuracy with which the grafts are brought end on and in precise contact with the cross area of the central and distal stumps.

After the nerve has been freed from scar tissue and the nerve ends have been successively incised until a satisfactory cross area is obtained, one or two stay sutures are passed at the proper level before the continuity of the nerve is completely severed in order to hold the nerve in alignment, prevent rotation, and help in the fixation of the nerve ends during suture.

The distance to be bridged having been accurately measured, a skin nerve is laid bare over the desired length and fine waxed silk sutures are passed in accordance with the distance to be bridged. The nerve segments are cut and picked up by covering them with a moist cotton pad. If the cotton pad is carefully placed over the nerve and sutures they adhere to the moist cotton and each segment may thus be lifted from the wound and placed in the operative field. By this means the segments of the nerve are not handled and the nerve may be manipulated into its proper position for suture with the least trauma.

H. A. MCKNIGHT.

**Burke, N. H. M.: The Electrical Stimulation of Nerves at Operation.** *Lancet*, 1920, cxcviii, 761.

The author's observations are based on a study of 80 cases of peripheral nerve injuries. A Lewis sledge coil attached to a bipolar electrode with pin-point terminals placed close together meets all requirements. The nerve, which was freed below and above the site of injury, was stimulated before and after it was freed from the scar tissue. Stimulation was applied to different aspects of the nerve in an attempt to pick out the fibers supplying the various muscles.

In 25 of the cases studied the nerve was completely divided, in 13 almost completely divided, in 2 slightly divided, and in 42 cases involved with scar tissue. The author concludes that: (1) conductivity is conclusive evidence of the physiological continuity of nerve fibers, as is also excitability below the lesion; (2) improvement in conductivity or peripheral excitability following neurolysis suggests only slight compression and possibly chemical nerve block; (3) the absence of conductivity and excitability even after neurolysis is not conclusive evidence of division, but probably an indication of fairly severe nerve disturbance. W. O. ORT.

## MISCELLANEOUS

### CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

**Piersol, G. M.: Acidosis: Its Mechanism, Recognition, and Clinical Manifestations.** *N. York M. J.*, 1920, cxi, 793.

The author reviews the present state of our knowledge in regard to acidosis. Van Slyke's and Henderson's definitions of acidosis are quoted. The mechanism by which the normal equilibrium between acids and alkalies in the body is maintained is discussed.

Acidosis may be both true and compensated. In true acidosis, which is rare and incompatible with life, there is a definite increase of the hydrogen-ion concentration of the blood due to the failure of the defensive mechanism to restore the reaction of the blood to normal. In compensated acidosis the hydrogen-ion concentration of the blood is maintained at its normal level despite a decrease in the alkaline reserve.

The methods of estimating the failure of alkali reserve may be classified into three groups, those applicable: (1) to the urine; (2) to the respiratory apparatus; and (3) to the blood. Those applicable to the blood are the most direct and accurate. Van Slyke's method of determining the alkali reserve is recommended as relatively simple.

Acidosis is shown to be, not a clinical entity due to a single cause, but a state which may be produced by various conditions and is dependent upon several different mechanisms. It is always secondary; it may later become the cause of serious difficulties. Hyperpnoea without cyanosis or respiratory difficulty is the most striking if not the only gross clinical manifestation.

The acid intoxications of diabetes, starvation, and improperly balanced diets are described. Acidosis observed late in nephritis is a secondary phenomenon. A slight compensated acidosis has been observed frequently in pregnancy. In some cases of eclampsia marked acidosis has been found, while in others only the slight degree commonly present in pregnancy was noted. True acidosis has been found

after various operations and in such cases is apparently due chiefly to the anæsthetic, especially chloroform. True acidosis has been observed also in physiological shock but is considered a secondary manifestation and not a cause. The author discusses also acidosis in children. W. H. NADLER.

**Goetsch E.: The Epinephrin Hypersensitiveness Test in the Diagnosis of Hyperthyroidism.** *Pennsylvania M. J.*, 1920, xxiii, 431.

In hyperthyroidism there is hypersensitiveness to epinephrin proportional to the degree of the hyperthyroidism. In hypothyroidism there is an increased tolerance for epinephrin administered hypodermically. In other words, hyperthyroidism produces hypersensitiveness of the sympathetic nerve terminations upon which epinephrin has a specific stimulating action.

The technique of the epinephrin hypersensitiveness test is as follows:

The patient, particularly if a nervous individual, is put to bed at least a day previously. In other cases reclining for an hour or two in a quiet room is sufficient. Repeated readings are taken of the systolic and diastolic blood pressure, the pulse rate, and the respiration. These should be fairly constant. A record having been made also of the patient's subjective and objective condition, nervous manifestations, throbbing of the heart and arteries, heat and cold sensations, asthænia, pallor or flushing of the hands and face, tremor, perspiration, etc., 0.5 ccm. (7.5 minims) of a commercial 1:1,000 solution of adrenalin chloride is injected into the deltoid region. The pulse, blood pressure, and respiration, and any changes in the subjective and objective manifestations are then noted every two and a half minutes for ten minutes, then every five minutes up to one hour, and then every ten minutes for half an hour.

In a positive reaction there is an early rise in the systolic pressure, a fall in the diastolic pressure, and a rise in the pulse rate of at least 10 and sometimes as many as 50 pulsations per minute. With these changes many of the signs and symptoms of the



clinical picture of hyperthyroidism are brought out. A normal person shows no reaction whatever or only a very slight reaction.

The epinephrin test is of value in distinguishing cases of true hyperthyroidism from cases of tuberculosis with a clinical resemblance to Grave's disease, and indicates the degree of toxicity in early exophthalmic goiter. It is an extremely simple and inexpensive test which requires little time and is not at all uncomfortable. The features of the reaction are sharp, clear, and characteristic.

M. H. KAHN.

**MacCarty, W. C.: A Mathematical Terminology for Neoplasia and Its Significance.** *Northwest Med.*, 1920, xix, 113.

Although neoplasms have been recognized since the beginning of recorded medical history, our real knowledge of tumors, especially cancer, dates back to Hippocrates. The cellular nature of the growths, however, was not known until the time of Johannes Mueller and Rudolph Virchow. Much has been written but little real knowledge has been added to that of fifty years ago.

The idea that neoplasms originate in acquired or inherited rests is still prevalent even among expert pathologists. Some persons consider neoplasia a thing apart from cellular regeneration or hyperplasia; that it represents some intrinsic cellular abnormality or a disturbance of body control over growth.

Nature provides for the regeneration of human tissues by direct division of specific tissue cells and division of reserve cells set apart for the purpose of regenerating specific tissues by the process of multiplication, specialization, and differentiation.

During chronic destruction of tissues the reserve cells react in a definite manner characteristic of living cells; they become hypertrophic, hyperplastic, and migratory. This may be interpreted as hyperactivity against antagonistic forces, increase of mass action against such antagonists, and an attempt at change of environment. Such phenomena as differentiation, specialization, and regeneration have not been appreciated as potentialities of the ovum. It is correct to state that from the ovum all the different kinds of human cells arise.

The cells of each tissue must be regenerated during life or must be so plentiful that partial destruction will not be fatal to the whole communism. Hypertrophy, hyperplasia, and migration, which are known to occur in at least eleven tissues of the human body, may be hypothetically applied to all known tissues, although some are so highly differentiated and specialized that they have no power of regeneration. All our tissues are capable of regeneration, directly or indirectly, but the degree of regeneration varies for the different tissues.

The anatomical location, gross manifestations, biological reactions, and degree of cellular differentiation must be known in each case of regeneration of tissue since they are important in determining

the limits of the neoplastic process and hence in arriving at a prognosis.

Neoplastic cells reproduce themselves slowly or rapidly. Sometimes they become rapidly differentiated into adult tissue cells, for which they were originally intended as regenerative (textoblastic) cells. Sometimes they become incompletely differentiated and at other times remain absolutely undifferentiated. All neoplasms therefore may be divided into three groups: textomata, pseudo-textomata, and blastomata.

Textomata are neoplasms composed of one or more completely differentiated tissues. Such tumors are very slow in growth as a result of rapid and complete differentiation into adult tissue cells. Detrimental effects are produced usually by pressure or interference with the blood supply of surrounding organs or tissues.

Pseudo-textomata embrace all neoplasms composed of partially differentiated cells resembling the adult tissue cells; for example, adenocarcinoma. Clinically they have the detrimental qualities of textomata and also those of direct invasion and metastasis.

Blastomata include all neoplasms composed of undifferentiated cells regardless of their origin, which is usually indeterminable except by location. If there are any morphological characteristics suggesting normal adult tissue, the neoplasm should be classed as a pseudo-textoma. These are clinically malignant by virtue of their completely undifferentiated cells. Because of their more primitive type they are governed by the laws of cells rather than the laws of multicellular organisms. They are cytotypic, not textotypic, and their power of reproduction and migration is greater.

The most important factor relative to blastomata is their benignancy or malignancy. This is dependent upon the rapidity of growth, degree of cellular differentiation, encapsulation, locality, and migration of cells. The natural defensive mechanism of the individual possessing the growth, which is also an important factor, is not sufficiently understood, although certain facts with regard to it, such as lymphocytic infiltration, fibrosis, hyalinization, and calcification, are known. The importance of these and other yet undiscovered defensive reactions is a subject for further study.

Textomata are benign, pseudo-textomata are less benign, and blastomata are least benign; or blastomata are malignant, pseudo-textomata are less malignant, and textomata are least malignant.

M. R. HOON.

**Cleland, J. B., and Paul, N.: Rodent Ulcer and Allied Growths: An Analysis of 60 Australian Cases.** *Med. J. Australia*, 1920, i, 407.

Rodent ulcers are more prevalent in Australia than in Great Britain. The majority of skin neoplasms, and certainly the rodent ulcer group, are of epiblastic origin. In spite of this uniformity of origin and presumed equality of potentialities, how-



ever, the ultimate highest development of the cells depends upon the structures among which they are situated and upon their location in relation to the entire body. In this connection the authors suggest that transplantation of the epiblastic covering of chorionic villi to a denuded skin surface might lead to a successful take with the formation of squamous epithelial surface.

The authors divide these new growths into two main types which grade into each other: (1) those resembling the surface epithelium, and (2) those more or less imperfectly resembling glandular adnexa. At one end of this scale the typical rodent ulcer derived usually from the pilo-sebaceous structures is found and at the other end the typical squamous epithelioma with its well-marked cell nests.

Four case histories typifying various gradations in the scale of the classification are presented with detailed descriptions of the microscopic findings.

R. B. BETTMAN.

**Landau, H.: Partial Antigen Therapy According to Deycke-Much and Its Significance in Surgical Tuberculosis** (Die Partialantigen-therapie nach Deycke-Much und ihre Bedeutung fuer die chirurgische Tuberkulose). *Arch. f. klin. Chir.*, 1920, cxiii, 397.

In the theoretical part of his article the author points out that the partial antigen therapy does not differ essentially from the tuberculin treatment as the antigenic quality of the tubercle fats has not been proven. In 12 cases of surgical tuberculosis treated with partial antigens no demonstrable result could be attributed to the treatment, although it may have been responsible for transient improvement noted. The intracutaneous reaction is not sufficiently definite to be of value in the diagnosis. Partial antigen therapy therefore can be considered only an adjunct to the ordinary treatment.

FLESCH-THEBESIUS (Z).

**Rapp, H.: The X-Ray Treatment of Surgical Tuberculosis in the Reserve Hospital Bad Rappennau, 1914-1918** (Ueber die Roentgenbehandlung der chirurgischen Tuberkulose im Reservelazarett Bad Rappennau, 1914-1918). *Strahlentherapie*, 1920, x, 290.

In the X-ray treatment of surgical tuberculosis advantage should be taken also of climatic and balneologic factors. General treatment, sun baths, artificial heliotherapy, rest, and a favorable diet all greatly aid the X-ray treatment.

The author reports the results obtained by months of treatment in 300 cases of tuberculosis of various forms and stages. The patients were soldiers whose general condition was good; most of them had no pulmonary involvement. In many cases healing was obtained without any surgical treatment when X-ray treatment was given immediately after an early diagnosis and continued for some time.

Especially good results were obtained (100 per cent) in cases of simple, closed, and caseated lymph-gland involvement. Occasionally a minor procedure such as aspiration or excocleation was necessary. Injections of iodoform-glycerin proved unsatisfactory, hastening the caseation. Frequently for a few days after the X-ray treatment a reaction was noted such as swelling, pain in the gland, local hyperæmia, and fever. The results were not as good in cases of suppurating lymphomata with fistula formation. In addition to local improvement and often preceded by it the general condition improved. It was found important to obtain free drainage by means of tube drains rather than by gauze strips. The duration of treatment averaged fourteen months. Peritonitis was cured in from four to six months in 90 per cent of the cases but only cases of dry peritonitis were treated. The patient's general condition improved first and the local condition later. In raying the abdomen unpleasant effects were avoided by exposing only 6 fields at one session.

Tuberculosis of the joints responded much more slowly and frequently the result was only partial. The effect of the raying was variable. The synovial form reacted more favorably than the bony form. No surgical intervention was necessary in the former except perhaps puncture of the focus and withdrawal of the pus. In the bony form, in spite of the surgical removal of sequestra, free exposure of the joint, etc., only a small number of cases were ultimately cured. Some of them showed temporary improvement but in others resection or amputation was necessary. One cause of the poorer results was the presence of pulmonary lesions. The results were particularly poor in the bone cases if surgical intervention had preceded the treatment or a fistula had developed. A cure was obtained occasionally, however, when the entire tuberculous bone was removed and the treatment was given energetically.

Three cases of caries of the rib were cured. Undermining of tissue in wounds should be avoided, free drainage should be established, and every secondary infection should be avoided.

Tuberculosis of the spine is especially resistant. In a case of bladder involvement definite improvement followed the removal of a tuberculous kidney; three fistulæ closed up. Involvement of the testicle and epididymis without caseation was completely cured; suppurating or caseating organs were resistant even after excocleation. Tuberculous anal fistulæ did not react at all; of two cases of tendon-sheath involvement one reacted favorably. The technique used for the different forms is given in detail.

SIMON (Z).

**Scholl, A. J., Jr.: Anthrax; A Comparison of the Surgical and Non-Surgical Methods of Treatment.** *J. Am. M. Ass.*, 1920, lxxiv, 1441.

The author reviews the literature on anthrax and reports 51 cases treated in the Massachusetts General Hospital between 1888 and 1918.



Cellulitis or carbuncle are often confused with anthrax. An early diagnosis may be obtained, however, from the bacteriological demonstration of the anthrax bacillus in the lesion. Material for examination will be found by raising the crusted edge of the lesion.

Various methods of medical treatment have been advised. Sclavo reduced the mortality in a series of Italian cases from 25 to 6 per cent by means of anthrax serum. In 200 cases treated by Krause with normal beef serum the mortality was 0.5 per cent.

The author contrasts 9 surgically treated cases with 42 cases treated by expectant methods. The non-surgical treatment consisted in confining the patient to bed and immobilizing the infected area. A light diet and a maximum amount of fluid were given.

The average duration of the disease was 23 days in cases followed by recovery and 4 days in fatal cases.

Eighty-two per cent of the patients had lesions about the head and neck. Cervical infections are especially dangerous because of the resulting oedema and the proximity of vital structures. The intensity of the general symptoms such as nausea, vomiting, and restlessness gives no constant indication of the extent of the disease. In a number of cases an abrupt onset of severe general symptoms was followed by a rapid and favorable termination of the infection.

In the 51 cases there were 7 deaths (13.7 per cent). Four of these deaths were those of patients treated surgically. Therefore the mortality of surgical treatment was 44 per cent, while that of non-surgical treatment was 7 per cent.

The disparity of the results following surgical and non-surgical methods of treatment is very striking. Surgical interference is not only futile but harmful since it tends to increase and spread the local lesion by breaking down the natural barriers to the disease and opening up new portals of entry. Operation was followed so closely by septicaemia and death in a number of cases that it came to be regarded as a causative factor.

### BLOOD

Myers, V. C.: **Chemical Changes in the Blood in Disease.** *J. Lab. & Clin. Med.*, 1920, v, 418.

The origin of the various non-protein nitrogenous compounds, the rôle which they play in metabolism, and the ease of kidney secretion have a decided effect on the content of these substances in the blood both normally and pathologically.

Urea is formed largely in the liver from the ammonia resulting from the deamination of amino acids which are set free in digestion but are not of immediate use to the organism. It is largely exogenous in origin. Creatinine is probably formed in muscle tissue from creatine. It is almost entirely endogenous in origin. Uric acid originates from the enzymatic transformation of amino and oxy-purines.

Under ordinary dietetic conditions it is partly exogenous and partly endogenous.

Normally the non-protein nitrogenous constituents vary in their proportionate partitions in the urine and the blood. In the urine the amounts expressed in per cent of the total non-protein nitrogenous constituents are approximately: urea nitrogen, 85 per cent; uric acid, 1.5 per cent; creatinine, 5 per cent; ammonia nitrogen, 4 per cent; and undetermined nitrogen, 4 per cent. In the blood the proportions are: urea nitrogen, 50 per cent; uric acid, 2 per cent; creatinine, 2 per cent; ammonia nitrogen, 0.3 per cent; and undetermined nitrogen, 46 per cent.

The kidney removes ammonium salts and creatinine from the blood almost completely. Uric acid is excreted with difficulty. Urea holds an intermediate position. In renal insufficiency, therefore, there is retention first of uric acid, then of urea, and lastly of creatinine.

The selective action of the kidney holds the urea nitrogen at the level of about 50 per cent of the total non-protein nitrogen in the blood. When the renal function is impaired, as in chronic interstitial nephritis, bichloride poisoning, polycystic kidney, malignancy, pneumonia, intestinal obstruction, and some cases of acute nephritis, the urea retention may be very high. In cases of gastric and duodenal ulcer there is often a slight urea retention. In eclampsia, the blood urea is only very slightly elevated, if at all.

In cases of advanced nephritis the estimation of urea is of less prognostic value than the estimation of creatinine but it is a better guide to the value of the treatment. In prostatic obstruction the estimation of urea is of great prognostic importance. When the urea nitrogen is 30 mg. or over, the outlook is poor.

There are two lines of attack in treating patients with nitrogen retention: (1) increasing the kidney output; and (2) decreasing the nitrogen intake. The first method is of doubtful value, especially in chronic cases. The second method is of great value, but obviously a protein-free or very low protein diet cannot be continued for long periods.

SAMUEL KAHN.

### BLOOD AND LYMPH VESSELS

Roussiel, M.: **Circular Suture of the Brachial Artery in Man** (De la suture circulaire de l'artère humérale chez l'homme). *J. de chir.*, 1920, xvi, 18.

The author has found in the literature 7 cases of circular suture of the brachial artery. To these he adds the histories of 3 of his own. In the 10 cases the results were successful in 7 and unsuccessful in 3. The failures were due to the extent of the traumatism or infection.

The techniques of the various operations are described.

Suture is indicated when section or a thrombus is situated above the origin of the deep brachial artery,

as in such cases there is always grave danger of gangrene of the limb. It is indicated also in cases of section below the origin of the deep brachial artery in which the violence of the traumatism has caused thrombosis of the collateral arteries, thus hindering the development of a collateral circulation. If the brachial artery is sectioned below the origin either of the superior internal collateral artery or of the lower collateral artery ligation of the two arterial ends will suffice if the collateral circulation is assured by anastomoses of the deep brachial artery with the recurrent radial arteries or anastomoses of the internal collaterals with the anterior and posterior recurrent ulnar.

Circular suture of the brachial artery is contraindicated in infections of the arm and extended contusions complicated by septic necrosis of the muscles. With these exceptions, however, it is the treatment of choice in complete traumatic section.

That ligation of the brachial artery is not without grave danger is shown by the statistics of Makins who reported 3 cases of gangrene in 4 cases in which such ligation was done. Although simultaneous section of the brachial artery and its dependent veins is very serious, the incidence of gangrene following simultaneous ligation of the artery and veins is, according to Makins, 24.5 per cent.

In 2 of the 3 cases operated on by the author the results were successful. In 1 of these 2 successfully treated cases the artery had been almost completely sectioned and in the other a vast thrombosis had formed and there was gangrene of the hand and forearm. In the third case the operation failed because of the great extent of the traumatism and amputation of the limb became necessary. The Carrel technique was employed. W. A. BRENNAN.

#### GENERAL BACTERIAL INFECTIONS

**Eberle, D.:** *The Treatment of Tetanus by the Combined Intracranial, Subdural, and Intraspinal Injection of Antitoxin According to Betz and Duhamel* (Zur Behandlung des Tetanus durch kombinierte intrakranielle, subdurale und intraspinale Antitoxininjectionen nach Betz und Duhamel). *Deutsche med. Wchnschr.*, 1920, xlv, 94.

In 1916 Fraenkel recommended the intracranial subdural injection of tetanus antitoxin in the treatment of tetanus. Betz and Duhamel were able by this method to cure 3 out of 4 severe cases. In 10 cases reported by other men the value of the procedure was again demonstrated as 8 of the 10 patients recovered. Eberle tried it in 3 cases which came to treatment between the fifth and seventh days, but all of these were fatal. The injection, which only increased the intracranial pressure and aggravated the symptoms, did not have any influence upon the convulsions. Schmidt also was unsuccessful with the method in 8 cases. All of these were treated on the first day of the disease after an incubation period which in some cases was eight days in length.

KREUTER (Z).

#### SURGICAL DIAGNOSIS, PATHOLOGY, AND THERAPEUTICS

**Strangeways, T. S. P.:** *Observations on the Nutrition of Articular Cartilage.* *Brit. M. J.*, 1920, i, 661.

The author does not believe that the nutrition of the cartilages of joints is derived from the vessels of the adjoining structures, the marrow and bone and the circulus articuli vasculosus, as is now the accepted view. In his opinion its source is the synovial fluid of the joint.

Four instances of loose bodies in joints are discussed, the attempt being made to prove that the bodies were fragments of cartilage broken off by trauma and received their nutrition from the synovial fluid.

The author holds that if his hypothesis is true the cause of degenerative processes in arthritis is due to a decrease in the nutritive value of the synovial fluid. B. R. PARKER.

#### EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

**Stewart, M. J.:** *On the Use of Polarized Light in the Detection and Investigation of Suture Materials Embedded in the Tissues.* *Brit. M. J.*, 1920, i, 663.

This article presents a study of the optical activity of certain suture materials and the detection of their presence in sections of tissues by means of the polarizing microscope.

Silkworm gut, silk, and linen are very active optically and retain this activity for years, even after the fibers have degenerated and have been invaded by foreign body giant cells. The method described is inapplicable to catgut, however, as this suture material loses its optical activity in a short time.

A source of grave error in the procedure is the presence on the surface of the sections of small air-born particles of cotton wool which have also a high optical activity. B. R. PARKER.

#### ROENTGENOLOGY AND RADIUM THERAPY

**Watkins, W. W.:** *The Pathologic Findings in 1 000 Roentgen-Ray Examinations of the Digestive Tract.* *Am. J. Roentgenol.*, 1920, n. s. vii, 234.

This report has a threefold object: to tabulate the findings in the cases of patients coming to the general practitioner with chronic symptoms referred to the digestive tract; to illustrate the importance of thorough gastro-intestinal X-ray examinations, however definite the symptoms; and to demonstrate the frequency of certain lesions and combined lesions of the digestive tract.

The findings in 400 cases with indefinite symptoms were negative in 92. Uncomplicated disease of the appendix was found in 90; duodenal ulcer in 28; stomach ulcer in 18; peritoneal adhesions in 38;



chronic gall-bladder disease in 27; tuberculous colitis in 18; diverticula of the colon in 5; cancer of the stomach in 5; cancer of colon in 5; and several other conditions in single cases. Fifty-three cases in this group showed multiple lesions.

In 270 cases with symptoms of stomach or duodenal disease uncomplicated gastric or duodenal lesions were found in 137, multiple lesions in 21, and negative findings in 57. Of 155 cases with symptoms of gall-bladder disease 89 showed signs of gall-bladder disease with or without complications, and 27, lesions outside the gall-bladder. In 44 of these cases the examinations were negative. In the 140 cases with symptoms pointing to disease of the appendix, pathologic conditions in the appendix region were found in 97; negative findings in 26; and various other lesions with or without appendix complications in 17. In 35 cases in which the symptoms were limited to the colon, colonic adhesions were found in 12 and other conditions in 11. In the remaining 12 cases the findings were negative.

In the entire series of cases pathologic appendices were found in 323, this being the most common lesion. In 183 there were signs of chronic gall-bladder disease, while duodenal ulcer was demonstrated in 124 and stomach ulcer in 93. Adhesions involving the colon were found in 50 cases; cancer of the stomach in 36; tuberculous colitis in 24; syphilis of the stomach in 5; pyloric stenosis in 2; diverticula of the colon in 9; and diverticula of the duodenum in 4.

Ninety-five patients showed two distinct lesions and 9 had triple lesions. There were 46 patients with combined gall-bladder and appendix disease; 16 patients with duodenal ulcer and chronic appendicitis; 13 patients with stomach ulcer and chronic appendicitis; 8 patients with both stomach and duodenal ulcer; 3 patients with duodenal ulcer and gall-bladder disease; 2 with stomach ulcer and gall-bladder disease; and 1 each with appendicitis and ureteral stone, appendicitis and duodenal diverticulum, appendicitis and colon diverticula, appendicitis and tuberculous colitis, appendicitis and spondylitis, duodenal ulcer and tuberculous colitis, duodenal ulcer and stomach cancer, gall-bladder disease and tuberculous colitis. The triple lesions were as follows: 6 cases of disease of the gall-bladder and appendix with ulcer; 1 case of gall-bladder disease with both stomach and duodenal ulcer; 1 case of stomach and duodenal ulcer and chronic appendicitis; and 1 case of gall-bladder disease with stomach ulcer and tuberculous colon.

The negative findings reported in 240 of the 1,000 cases with definite symptoms in the digestive tract are ascribed to one of three factors: (1) failure on the part of the clinician to make a complete examination; (2) reflex symptoms in the digestive tract caused by lesions elsewhere; (3) failure to demonstrate the lesions present. In the series reported the first of these causes is the most important.

Appended to the article is a table giving the operative and roentgen findings in 146 cases. In

35 cases there was more or less disagreement between the X-ray and the operative findings, while in 111 the X-ray examinations correctly foretold the operative findings. Of the 35 cases in which there was disagreement in the findings, only a partial examination was given in the first 10 and the lesions were found at operation in organs not examined by the roentgen ray. In the next 6 cases the examinations were negative for appendix disease, but the patients were operated upon for acute appendicitis at later periods. These were therefore cases of chronic appendix disease with an acute termination or cases in which the occurrence of acute appendicitis was merely a coincidence. The next 7 cases gave X-ray evidences of ulcer, but at operation no ulcer was found by palpation. Rather than enter into an argument regarding the reliability of excluding ulcer by palpation, the author classes the X-ray diagnoses in these cases as errors. In the remaining 12 cases also the X-ray diagnosis was erroneous.

ADOLPH HARTUNG.

**Huessy, P.: Radiation of Malignant Tumors** (Nach dem vierten Jahre Bestrahlung bösartiger Tumoren). *Strahlentherapie*, 1920, x, 45.

The author is of the opinion that the most essential factor in the treatment of malignant tumors with radium and the X-ray is the avoidance of the irritating dose. Every cancer cell should get only the fatal dose, never an irritating dose. Observation has proved that recurrences following radiation grow extremely rapidly whereas those following operation do not. The former also metastasize rapidly and therefore cannot be attacked therapeutically. In his own cases the best results were obtained by operation followed by radium.

Even the smallest dose of X-ray treatment aggravates the condition and therefore the author entirely discards such treatment after operation. Even in operative cases it does harm and in inoperable cases it does not offer as much benefit as excochleation. Radium, however, often gives results lasting for years. In cases of cancer of the cervix the author has done an excochleation to reduce the amount of cancer tissue present before treating with radium.

The question whether operation or radiation should be employed cannot yet be answered.

SIMON (Z).

**Maury, J. M.: The Results of the Exposure of Animal Ovaries to the Rays of Radium.** *J. Am. M. Ass.*, 1920, lxxiv, 1711.

The experiments recorded were made for the purpose of determining the changes brought about in the ovaries of rabbits by exposing them to 50 mg. of the element radium for twelve hours. This dosage was selected because it is that generally used in cases of so-called idiopathic uterine bleeding which are now regarded as due to an abnormal condition of ovarian secretion.

Fifteen female rabbits were treated, each being given a dosage of 600 milligram hours, the radium



being applied to the skin surface overlying the ovaries. One was killed in three weeks, 2 in four weeks, 2 in five weeks, 4 in six weeks, 3 in eight weeks, and 4 in nine weeks. The ovaries removed were not touched with the fingers or forceps. They were placed in 70 per cent alcohol at once and run up for paraffin sections as soon as possible. The first few were sectioned serially and examined throughout. This consumed a great deal of time, and was found to be unnecessary. Therefore from the other ovaries from 50 to 75 sections were removed from each side and from the middle portion for examination, making about 150 to 200 sections from each. In the examination of sections special attention was given to the germinal epithelium, the connective tissue cortex, the blood vessels, and the follicles.

Microscopically, the ovaries varied greatly in size. One, a sclerotic ovary, was a mere strip of tissue which, as seen under the microscope, was composed of only connective tissue with almost no follicles. The author does not believe this condition was the result of the exposure to the radium as the ovary was removed only three weeks after the treatment and as there were no signs of follicles in a state of degeneration and almost no small follicles of any size, the change was so great that it could hardly have taken place in three weeks. The variation in size seemed to depend on the number and size of the atretic follicles and corpora lutea present. Both in number and size these structures varied greatly in different ovaries. In all of those examined the germinal epithelium was present and in normal condition. The connective tissue cortex varied greatly in thickness in different ovaries, even the two ovaries from the same animal presenting considerable variation. The blood vessels showed no signs of endarteritis, and as they normally have thick walls, this change would have been observed easily if it had been present.

As would naturally be expected, the greatest variation was shown in the condition of the follicles. In 7 of the ovaries examined there were no follicles approaching maturity either alive or in a state of degeneration. In 12 there were living follicles at or close to maturity which showed no evidence of having been affected by the treatment. In the remaining 11 all the large follicles were in a state of degeneration. Therefore when the 7 ovaries not containing follicles of sufficient size to be supposedly affected by radium are deducted, 23 remain, 12 of which contained large follicles showing no effect of the treatment.

Convincing evidence of the viability of the ovum when it was discharged from the ovary was obtained in the cases of 2 rabbits which were put with a male and became impregnated five weeks after the treatment. In one case 4, and in the other 5 embryos were removed from the uterus several weeks later.

Two other animals which had become pregnant were later treated and did not miscarry, a fact

which indicated that the membrana granulosa of the mature follicles from which the corpus luteum cells are probably formed was not degenerated as it is well known that if the corpus luteum of pregnancy is destroyed in its early stages the foetus will be cast off.

On the basis of these results the author considers it a fair deduction that a 600 mg.-hour dosage of radium does not produce degeneration of the follicles of the ovaries.

C. H. DAVIS.

## LEGAL MEDICINE

### Liability of Physicians—Advising Local Physician. *Thornburg vs. Long (N. C.) 101 S. E. R., p. 99.*

The plaintiff, Thornburg, when suffering from a swollen arm was sent by a local physician to Dr. Long, a physician in a nearby town. Dr. Long examined him, took a blood test, and came to the conclusion that he was suffering from syphilis. Thornburg doubted the diagnosis and returned to the local physician. The local physician lanced his arm and he subsequently recovered. Thornburg then sued Dr. Long for the mental and physical pain caused him by his failure to diagnose the case properly. The lower court brought in a verdict for the defendant and the plaintiff appealed.

The upper court held that a physician who undertakes to treat a patient makes an implied contract to use all known and reasonable means to accomplish the object for which he was called and that he will attend the patient carefully and diligently. He does not guarantee, however, that he will cure him or that he will not commit an error in judgment. The court further held that Dr. Long was not negligent, that he used the usual means to determine the nature of the patient's malady, and that his error was an error of judgment. He therefore was not liable.

The question was raised also as to whether or not Dr. Long violated his duty as a physician in communicating to the local physician the nature of the patient's disease, but the court held that since the local physician sent the patient to Dr. Long it was the latter's duty to report back to the local physician. The finding of the lower court was affirmed.

J. A. CASTAGNINO.

### Implication from Collection of Hospital Fee. *Courchesne vs. Brown (Texas) 216 S. W. R., p. 674.*

In this case the subject under discussion was the deduction of small amounts from the wages of employees for the purpose of establishing hospital funds. The facts were as follows:

Brown was employed by Courchesne. It was Courchesne's custom to deduct \$1.00 per month from the wages of his employees to establish a fund for the payment of a physician, a nurse, and hospital fees during the illness of any of his employees. This fund was not connected with the insurance policy which Courchesne carried under the terms of the Workmen's Compensation Act.



Brown was taken sick with appendicitis and incurred and was forced to pay a debt of \$567.00 for medical services and hospital fees. Courchesne refused to reimburse him for this amount and Brown therefore brought an action against him. The lower court entered a judgment for \$567.00 in favor of Brown. Courchesne appealed.

The upper court held that an employer who deducts a portion of employees' wages for the purpose of accumulating a fund for the care of his employees during illness assumes no personal responsibility other than the proper and faithful administration of the trust fund. It held also that an employee suing to recover hospital expenses from an employer who had deducted a hospital fee from his wages had the burden of proof in alleging that the fees were collected as a present hospital fund to be used in case of sickness and that the employer had on hand sufficient funds to pay such expense. In this case no evidence was introduced by the plaintiff to prove the latter contention and the judgment of the lower court was reversed.

J. A. CASTAGNINO.

**Workman's Compensation Before and After Amputation.** *Addison vs. W. E. Wood Co., et al.* (Mich.) 174 N. W. R., p. 149.

In this case the plaintiff filed a claim with the Industrial Commission against the defendant company for a fractured limb which he sustained while in the company's employ. The Industrial Commission awarded him \$10.00 a week for 54 weeks which is allowed under the statutes for total disability. Later it became necessary to amputate the limb and the Industrial Commission awarded \$10.00 a week for 125 weeks, the payments to date from the time of the amputation.

The company appealed from the ruling of the Industrial Commission, contending that the payments should date from the time of the original injury rather than from the date of the amputation. The upper court held, however, that Addison was entitled to \$10.00 a week for 54 weeks for total disability and an additional \$10.00 a week for 125 weeks, the payments of this later allowance to date from the amputation.

J. A. CASTAGNINO.

**Question Whether or Not Disease Was Chronic Held, on Evidence, for Jury.** *Coffey vs. Northwestern Hospital Assn.* (Ore.), 183 Pac. R., p. 762.

The plaintiff had a contract with the defendant, the Northwestern Hospital Association, by which she was entitled to medical and hospital services for any sickness or injury except a chronic disease. The plaintiff suffered from prolapse of the uterus, and requested the defendant hospital to treat her. The hospital contended that the condition was chronic as the plaintiff had suffered from the same ailment two years prior to entering into the contract. It therefore refused to treat her. The plaintiff sued on the contract and recovered a judgment for \$1,500. The defendant appealed the case.

In reviewing the case the upper court defined a chronic disease as a disease of long duration or a disease characterized by slowly progressive symptoms. Whether or not the condition referred to in this case was a chronic disease was a question of fact for the jury to determine and the burden of proof was upon the plaintiff to show that it was not a chronic disease. The court held further that the evidence indicated that the plaintiff had entirely recovered from the first attack and that the second attack some two years later was brought about by heavy lifting and was therefore not chronic. The judgment of the lower court was affirmed.

J. A. CASTAGNINO.

**Ratification of Employment of Physician.** *Baker vs. Brown & Hackney, Inc.* (Ark.) 215 S. W. R., p. 578.

White, an employee of the defendant company, Brown & Hackney, was injured during his employment. An agent of the company called Dr. Baker to attend him and Dr. Baker continued to treat him for a considerable length of time. The company refused to pay Dr. Baker for services other than first aid as it contended that the agent had authority to employ a physician for first aid only. Baker sued the company for \$1,100.00. The lower court instructed the jury that the company was liable only for first aid and the jury brought in a verdict for \$24.00.

Baker appealed on the ground that the company knew that he continued to render services to White and by its silence acquiesced and ratified his employment by the agent. This contention was sustained by the upper court and the judgment of the lower court was reversed.

J. A. CASTAGNINO.

**Anthrax as an Accident.** *Eldridge vs. Endicott, Johnson & Co.*, 189 N. Y. App. Div. 53, 177 N. Y. Supp., p. 863.

Whether or not anthrax is to be considered an accident under the terms of the Workmen's Compensation Act is the question considered in the case reported. The facts were as follows:

The widow of a former employee of Endicott, Johnson and Company filed a claim against the company with the Industrial Commission for the death of her husband who died from anthrax which was contracted from handling hides in the tannery of the defendant company. The evidence showed that the former employee had received a slight cut on the neck in a barber shop while he was being shaved and that the anthrax infection began in this cut.

The Industrial Commission held that the deceased was injured during his employment. From this finding the company appealed.

The upper court held that the death was caused by anthrax and was not due directly to the cut on the neck. It therefore affirmed the award of the Commission.

J. A. CASTAGNINO.

**Unskilled Treatment of Injuries—Cross-Examination.** *Smith vs. Missouri K. & T. Ry. Co. (Okla.)* 185 Pac. R., p. 70.

In this case two interesting questions were involved, namely, the liability of the party causing an injury for the unskilled treatment of a physician called by him to treat the person injured, and the subject of cross examination. The facts were as follows:

While waiting for a train belonging to the defendant railroad, Smith was knocked down by the body of another man which was thrown violently against him when the man was struck by the approaching train. Because of unskilled treatment by the physician of the railroad company, Smith's injuries were aggravated. There was no question as to the liability of the railroad company or the unskilled treatment of the physician but the railroad company contended that as long as it used due care in the selection of a physician it was not liable to Smith for the physician's negligence.

The jury in the lower court brought in a verdict in favor of the railroad. Smith appealed, first on the ground that the company was liable for the negligence of the physician it called, and second, on the ground that the court erred in permitting the attorney for the defendant to extend his cross-examination of Smith's witness beyond the scope covered by direct examination.

The upper court held that unskilled treatment by the physician called by the party causing the injury, which treatment increased the injury, will render the party causing the original injury liable for all the injuries. It held further that cross examination cannot extend beyond matters brought out in direct examination. Therefore the judgment of the lower court was reversed. J. A. CASTAGNINO.

**The Treatment of Osteomyelitis—General and Special Employment.** *Nelson vs. Farrish et al. (Minn.)* 173 N. W. R., p. 715.

Nelson, the father of an 8-year-old girl, filed an action for malpractice against Drs. Farrish and Portmann for failure to make a proper diagnosis of the child's condition. The child was suffering from osteomyelitis of the radius. On November 12 Dr. Farrish was called to treat her and continued to treat her until December 3. On November 18 Dr. Portmann was called, examined the child, recommended certain treatment, and told the child's parents to call him if they wanted him again. The child grew worse and later was moved to a hospital after Dr. Farrish had been dismissed from the case. An operation was then performed by another physician.

Expert testimony was offered at the trial to show that the only treatment which will cure osteomyelitis is operation and that Drs. Portmann and Farrish, by their failure to recommend an operation, were negligent. Dr. Farrish contended that he recommended an operation but the father of the girl would not consent. The evidence in the case, however, was

in direct conflict with the contention of the doctor. Dr. Portmann contended that his employment in the case was special and not general and that he was not obliged to follow the case. The lower court entered a judgment against Drs. Farrish and Portmann. This judgment was appealed.

The upper court held that a physician called generally must give the case his continued service if the condition of the patient demands it, but if he is called specially, only on one occasion, he is not obliged to repeat his visits although this does not affect his liability for what occurred on the occasion of his visit. It held further that Dr. Farrish was called generally and was negligent in his diagnosis of the case and that Dr. Portmann was called specially but had reasonable time on his special visit to make a proper diagnosis which he did not do. Both doctors were held liable and the judgment of the lower court was affirmed. J. A. CASTAGNINO.

**Infection Carried from Toe to Face.** *Bethlehem Shipbuilding Corporation, Limited, vs. Industrial Accident Commission et al. (Calif.)* 185 Pac. R., p. 179.

The question under consideration in this case was whether or not death due to an infection carried from an injured toe to the face was the result of the original injury to the toe. The facts were as follows:

An employee of the Bethlehem Shipbuilding Corporation had his toe crushed in the course of his employment. A streptococcal infection set in and was followed by septicæmia, erysipelas of the face, and death. The Industrial Commission held that the infection was carried from the toe to the face by external means and that the death was the result of the original injury to the toe. The company appealed on the ground that the injured toe was not the proximate cause of death, but the finding and award of the Industrial Commission were confirmed by the upper court. J. A. CASTAGNINO.

**Verdict of Coroner's Jury Held Not Admissible in Evidence to Fix Liability in Civil Suits.** *Spiegel's House Furnishing Company vs. Industrial Commission (Ill.)* 123 N. E., p. 606.

The widow of a former employee of the Spiegel House Furnishing Company filed a claim with the Industrial Commission for the death of her husband. Her husband had come home from work complaining that he was not feeling well. A physician who was called told him he had a cold and a little fever. The next day he became worse, complained of a scab on his arm, and told his wife he knocked his arm against a corner of a dresser while showing customers through the store. The physician sent him to a hospital and a few days later he died of septicæmia.

A coroner's jury held that death was due to septicæmia caused by an injury of the arm inflicted by the corner of a dresser. The widow of the deceased was granted an award by the Industrial Commission and the award was affirmed by the circuit



court. From this finding the Spiegel House Furnishing Company appealed for the reason that no one had seen the employee injure himself and the Industrial Commission had based its decision on the verdict of the coroner's jury which it permitted to be offered into evidence. The supreme court held that a coroner's jury had no judicial power and their verdict had no weight in a civil suit to fix liability. It therefore reversed the order of the Industrial Commission. J. A. CASTAGNINO.

#### **Liability of False Representations as to Disease.**

*Truman vs. Manweiler et al. (Ind.), 125 N. E. R., p. 412.*

Friends of the defendant, Manweiler, represented to the plaintiff, Truman, that Manweiler was sick with "lung fever" and induced her to take him in and care for him. The plaintiff stated that if he were sick with a contagious disease she could not do so but was assured that he was not. Later she discovered that he had diphtheria, but in view of the fact that he was too ill to be moved she continued to nurse him. In bringing suit against Manweiler et al. she alleged that they were aware of the contagious disease and willfully misrepresented the facts. The defendants contended that they acted in good faith upon a physician's statement.

The Court held that whether they knew or not was a question of fact for the jury. From the evi-

dence the jury found that they were aware of the contagious nature of the disease and were guilty of fraud in misrepresenting it. Upon appeal the upper court affirmed the findings of the lower court.

J. A. CASTAGNINO.

#### **Rules Relative to Insanity as a Defense to Crime.**

*Thomson vs. State (Fla.), 83 So. R., p. 291.*

The plaintiff was convicted for murder in the first degree. The defense was insanity at the time of the act. Judgment imposing life imprisonment was rendered against him.

Upon review the court found that the evidence raised a reasonable doubt as to the plaintiff's sanity at the time of the act. The law presumes all men sane, and in the absence of evidence to the contrary the court and jury are justified in acting on this presumption. If the evidence tends to rebut the presumption of sanity, however, and if the jury entertain a reasonable doubt on the subject, it is their duty to acquit.

When insanity of a permanent type as distinguished from mental disorders resulting from disease is shown to have existed prior to the act, it may be presumed that such insanity continued up to the time of the act.

There having been a reasonable doubt in this case as to the sanity of the plaintiff, the judgment was reversed and the case sent back for a new trial.

J. A. CASTAGNINO.

# GYNECOLOGY

## UTERUS

**Delassus, A.: Trachelopexy in the Treatment of Severe, Rebellious Genital Prolapse** (Sur la trachelopexie recti-musculaire dans le traitement des prolapsus génitaux graves et rebelles). *Rev. franç. de gynéc. et d'obst.*, 1920, xv, 49.

The author describes Jacob's classical operation for removing the body of the uterus and fixing the remaining cervix to the abdominal wall. He has done the operation about 50 times and has modified it slightly.

Emphasis is placed upon the importance of preventing hæmorrhage. In one of the author's recent operations a voluminous hæmatoma developed. This was due to the slipping of a ligature about the ovarian artery. It was necessary to tie this artery separately.

Experience has shown that genital prolapse may recur even when a trachelopexy had been done with the most careful technique. The primary operation should therefore be complemented by a plastic perineal operation, or a larger portion of the tract should be removed, such removal being followed by a colpexy rather than a trachelopexy. Both of these procedures should be executed in one stage as patients will not usually submit to a second operation.

The immediate operative results are almost always good. In the 50 operations there was only 1 operative death. This was due to peritonitis. Local suppuration sometimes persists and is the cause of much trouble.

The remote operative results are encouraging. The operation should be reserved, of course, for cases of prolapse which have resisted other treatment. A total prolapse of the vagina, bladder, and rectum may occur postoperatively because the stump falls from the abdominal wall, becomes extraordinarily long (in one of the author's cases the stump was 12 cm. in length), or the vaginal tissues have undergone considerable relaxation.

The points to which the author draws particular attention are: (1) the isolation and separate ligation of the utero-ovarian vessels, which should never be ligated *en masse*; and (2) the fact that all complementary plastic procedures should be done by the lower route at the same time that the principal operation is done by the abdominal route.

W. A. BRENNAN.

**Bell, W. B.: The Surgical Treatment of Prolapse of the Uterus and Vagina.** *Lancet*, 1920, cxcviii, 993.

The author's observations and conclusions are based on approximately 400 cases in which 99 per cent of cures were obtained and the mortality

amounted to only 0.5 per cent. The operative treatment was responsible for the 2 deaths only indirectly.

The author classifies the clinical types of prolapse as "congenital" prolapse; puerperal retroversion and flexion, with slight, actual, or potential descent; vaginal prolapse; and prolapse of the uterus and vagina during or after the reproductive period.

Congenital prolapse is differentiated from the condition sometimes seen in infants with spina bifida. It occurs soon after puberty, is due to inherent defects in the pelvic floor, and must be distinguished from congenital hypertrophy of the vaginal cervix. Six patients with this condition were treated by reconstruction of the posterior segment of the peritoneal aspect of the pelvic floor and suspension of the uterus by a modified Gilliam operation.

Puerperal retroflexion occurs in the first stage of a large majority of all cases of acquired prolapse of the uterus, and should be treated as such. When uncomplicated by a vaginal laceration, a modified Gilliam operation alone is sufficient. Vaginal lacerations may occur at subsequent labors and necessitate further operative treatment, but the uterus will always maintain the good position obtained by a properly performed modified Gilliam operation if it is not delayed too long and a vaginal prolapse has not stretched the supravaginal cervix.

Vaginal prolapse may occur in the case of a normally placed uterus. In most cases it is represented by a large cystocele, rarely by a rectocele, and still more rarely by a cystocele and rectocele. Pelvic infection or some other pathologic cause obstructing the descent of the vaginal fornices sometimes may prevent stretching of the supravaginal cervix or prolapse of the uterus. Uncomplicated vaginal prolapse will respond to plastic vaginal operations. This condition is not common, however, and is usually associated with an abnormality of the uterus requiring further operative treatment.

Prolapse of the uterus and vagina may vary in all degrees from partial descent of one or both to complete procidentia. Before the menopause prolapse of the uterus and vagina, including prolapse of the congenital type, should not be treated by the "interposition" operation, ventrifixation, or peritoneal ventrisuspension operations because they frequently interfere with subsequent pregnancies. Repair of the vagina and perineum, amputation or repair of the vaginal cervix, and suspension of the uterus by a modified Gilliam operation have been found by the author to be the best procedures. In cases of marked prolapse, that is, procidentia, and especially in congenital prolapse, reconstruction of the peritoneal aspect of the posterior segment of



the floor of the pelvis is necessary. Even after this treatment, however, the repaired vagina and perineum may suffer injury during subsequent labors.

The majority of cases of prolapse of the vagina and uterus at or after the menopause show procidentia and may be complicated by ulceration. In cases in which there is no descent of the uterus, vaginal repair alone may suffice, but when there is any degree of descent, especially in the presence of cystocele, there is no operation to compare with the interposition operation together with colporrhaphies, anterior and posterior, and perineorrhaphy. In a few exceptional cases it may be necessary to reconstruct the posterior segment of the floor of the pelvis from above.

The author's method of reconstructing the posterior segment of the pelvic floor consists essentially in obliterating the pouch of Douglas by approximating the uterosacral ligaments in the midline by transverse sutures and fixing the rectum by means of sutures to the edges of the newly-formed aperture.

Emphasis is laid upon the pre-operative and postoperative treatment of the vagina. Before operation the vagina should be packed for several days with gauze soaked in a solution of Milton's fluid, this packing being changed every twelve hours. After operation it should be irrigated with Milton's fluid by means of a perforated tube doubled upon itself and inserted at the time of operation.

F. B. SETTLE.

**Baker, W. H.: A Few Observations Concerning Chronic Uterine Infections.** *J. Indiana State M. Ass.*, 1920, xiii, 166.

In his observations upon the treatment of chronic uterine infections the author recommends operation between ten and thirteen weeks after the acute stage when there is no fever and the white blood count is not above 9,000 whites per cubic centimeter.

His conclusions are as follows:

1. The removal of the tubes or of the tubes and uterus in extensive infection results in a disturbance of the glands of internal secretion. The symptoms produced by double salpingectomy and by salpingectomy with subtotal hysterectomy are about the same except that menstrual symptoms and leucorrhoea are less marked following the combined operation.

2. The disturbance of the glands of internal secretion in pelvic operations on women must be due to interference with the circulation to the ovaries or the fact that the tubes and uterus are part of a hormone of the sexual glands of internal secretion.

3. A subtotal hysterectomy should be done when infection of the pelvic organs is so great as to necessitate the removal of the tubes.

4. Menorrhagia and vaginal discharge follow in a number of cases operated upon for infection of the uterus or adnexa if the uterus is not removed at the time of operation.

5. Close attention should be paid to the problem of the postoperative vasomotor syndrome in these cases and its relation to surgery and infection.

H. B. MATTHEWS.

**Paramore, R. H.: Notes on the Causation of Red Degeneration.** *Lancet*, 1920, cxcviii, 1005.

Red degeneration is the thrombotic turgescence condition which results from vascular pressure changes. The author reports the case of a nulliparous woman who experienced a sudden attack of acute abdominal pain with nausea and vomiting. The pain persisted for six days and was finally relieved at the onset of the regular menstrual period. On examination a smooth round pelvic tumor was found attached to the uterine cervix. When the uterus was removed eleven days after the beginning of the illness a single intramural fibroid the color of raw meat was revealed.

The type of degeneration in the tumor described is thought to be the result of mechanical interference with the circulation. The frequent occurrence of the change in gravid uteri points to an increase in pressure as a causal factor. The relief from symptoms with the onset of menstruation was probably due to the relaxation of the uterine musculature.

The author compares red degeneration to the effects of torsion of the pedicle of an ovarian cyst. In the latter condition also there is a sudden attack of pain with rigidity of the abdominal muscles and a pelvic tumor due to obstruction of the venous return.

A. J. SCHOLL, JR.

#### ADNEXAL AND PERI-UTERINE CONDITIONS

**Barolin, F.: Hæmorrhage from the Ovaries** (Blutungen aus den Ovarien). *Med. Klin.*, 1920, xvi, 9.

The author reports 4 cases treated by laparotomy in which the operation and the histologic examination revealed hæmorrhage from the ovarian follicles and corpus luteum as the cause of peritoneal irritation. These hæmorrhages are probably more frequent than has been supposed heretofore. The site of the follicles remains a locus minoris resistentiæ for a long time as here the lutein layer consists of only one layer of cells whereas on the opposite side it has many layers.

Trauma, severe abdominal pressure, and menstruation must be considered as causes of ovarian hæmorrhage. The bleeding may occur at any time. In many cases it begins twelve or fourteen days before the onset of menstruation and in some it is associated with the so-called "Mittelschmerz." The hæmorrhage may be discovered accidentally and if the pain is diffuse, as is usually the case, the condition may be confused with appendicitis. The differentiation from extra-uterine pregnancy may also be difficult if the menstrual history is not definite. In both conditions a hæmatocele may form. In rare instances follicular hæmorrhage has caused death.

F. KAYSER (Z).

**Ley, G.: Primary and Secondary Carcinoma of the Ovary; a Statistical Record from the Pathologic Institute of the London Hospital.** *Proc. Roy. Soc. Med.*, Lond., 1920, xiii, Sect. Obst. and Gynec., 95.

The statistical record presented is based upon a study of 60 cases of ovarian cancer, in 25 of which the ovary was involved primarily and in 38 secondarily. In 3 of the latter the primary growth was in the opposite ovary. Ley classifies these neoplasms according to their histogenetic origin into:

1. Oöphoric: (1) arising *de novo*, site questionable; (2) arising from pseudomucinous cysts; and (3) arising from teratomatous (dermoid) cysts.

2. Epoöphoric and paroöphoric: (1) arising from wolffian relics in the ovary, the hilum of the ovary, or the broad ligament.

He believes that the frequently occurring pseudomucinous cyst is teratomatous in origin, representing the posterior end (hind gut) of the embryo in the same way that the so-called "dermoid" represents the cephalic end. His reasons for this opinion are: (1) that the epithelium is typical of gut and does not resemble that of the normal ovary; (2) that loculi lined by skin containing hair, etc. are found not infrequently; (3) that unstriped muscle is frequently found in the walls of these loculi; and (4) that loculi lined by cells of this type are not uncommon in "dermoid cysts."

Nine of the 25 cases of primary ovarian carcinoma were of pseudomucinous origin and 16 of wolffian origin (8 unilateral and 8 bilateral).

The study of the 25 cases of primary ovarian carcinoma is summarized as follows:

1. The majority arose either in the wolffian relics or in pseudomucinous cysts (hypoblastic teratomata).

2. The age incidence of the wolffian type was a decade later than that of the pseudomucinous type.

3. The malignancy as demonstrated by metastasis was much greater in the wolffian than in the pseudomucinous type.

4. In both types metastasis was most frequently peritoneal.

5. In the wolffian type the lumbar glands were involved first, and the iliac, coeliac, and pancreatic glands later.

6. No pseudomucinous cyst gave rise to glandular metastasis.

In the 38 cases of secondary ovarian carcinoma the site of the primary growth was: (1) the colon and rectum, 11 cases; (2) the stomach, 10 cases; (3) the gall-bladder, 2 cases; (4) the extrahepatic bile passages and caruncula major of Santorini, 2 cases; (5) the pancreas, 2 cases; (6) the breast, 4 cases; (7) the ovary, 3 cases; (8) the suprarenal gland, 2 cases; (9) the uterus, 1 case; (10) the kidney, 1 case. The ovarian secondary deposits were bilateral in 19 cases and unilateral in 19 cases. In the latter the primary growth was in the opposite ovary in 3 cases, so that carcinoma was bilateral in 22 cases and unilateral in 16.

The study is summarized as follows:

1. The statistics give no proof that ovarian metastasis is more frequently associated with primary carcinoma in any particular site.

2. The ovarian metastases were unilateral and bilateral in an equal number of cases.

3. The method of invasion was by implantation in 31 cases (81.5 per cent), direct in 3 cases (7.9 per cent), and by permeation of lymphatics in 3 cases (7.9 per cent).

4. Tumors of clinical significance occurred in 10 cases (28.9 per cent).

5. In 7 of these 10 tumors the growth in the ovary overshadowed the primary growth.

CAREY CULBERTSON.

## EXTERNAL GENITALIA

**Plondke, F. J.: Vaginal Drainage.** *Minnesota Med.*: 1920, iii, 251.

All cases of salpingitis should be regarded as septic and for that reason if any pus is spilled during the operation drainage should be instituted. The author contends that abdominal drainage is inadequate and that vaginal drainage by his method is better because it is more efficient and more comfortable and has none of the objectional features of abdominal drainage.

Before the abdominal operation is begun and after the vagina has been swabbed with iodine a curved 8 in., rat-toothed forceps is fastened to the posterior vaginal wall  $\frac{1}{2}$  in. behind the cervix. The patient is then laid flat for the abdominal section, the curved forceps being retained in the vagina.

When the operation has been completed, the curved forceps are pushed forcibly up into the cul-de-sac by an assistant until the operator can extricate the point. The jaws of the forceps are then opened in order to stretch the orifice. Into the open forceps are passed two strips of gauze and a rubber tube. These are pulled down into the vagina, their upper ends being left in the cul-de-sac. The tube is attached to the back of the uterus with a catgut suture and the abdomen then closed in the usual manner. The gauze is withdrawn in about three or four days but the tube is allowed to come out spontaneously. Convalescence rarely takes longer than two weeks. The method may be adapted also to cases of ruptured appendix.

The author prefers this technique because:

1. It is simple and comparatively easy.

2. By preliminary preparation of the vagina the entire procedure is rendered surgically clean.

3. The attendant who manipulates the forceps in the vagina need not be "clean" and will not disarrange the aseptic covering.

4. If the tube is sutured to the posterior surface of the uterus it cannot come away until the catgut stitch is absorbed. It then comes away easily and without causing pain.

5. It does not require the insertion of the assistant's fingers into the vagina to act as a guide and



consequently it eliminates the danger of the insertion of the fingers into the rectum and accidental opening of the bowel from above. If drainage is not necessary the forceps may be removed and no harm is done by the preliminary preparation.

EUGENE CARY.

**Judd, E. S.: The Operative Treatment of Vesicovaginal Fistulae.** *Surg., Gynec. & Obst.*, 1920, xxx, 447.

In former years vesicovaginal fistulae were found for the most part after difficult parturition. At present they are frequently the result of procedures for the radical removal of carcinoma of the cervix uteri by operation, cautery, or radium. Sixty-one per cent of cases of vesicovaginal fistula operated on at the Mayo Clinic since 1908 were due to some operative procedure for the removal of tumors of the uterus, and only 39 per cent followed childbirth. In 5 cases the condition followed the use of radium alone.

Radium is of undoubted value in inoperable carcinoma of the cervix but should not be used if the malignancy is not eradicated.

The scar due to cauterization and treatment with radium renders the technique of the operation for fistula much more difficult than in cases in which the fistula followed childbirth.

The first essential in the treatment consists in destroying the communication between the vagina and the bladder. This is accomplished best by dissecting the bladder completely away from the vagina as is done in the operation for the relief of cystocele. If the mucous membrane of the fistulous tract is not freed so that it can be turned into the bladder on the one side and into the vagina on the other, the communication will almost certainly reform. Undoubtedly in a certain percentage of these cases more than one operation is necessary and repeated attempts to close the fistula are advisable if the sphincter muscle of the bladder has not been destroyed. If the sphincter muscle is injured it should be repaired. If it is impossible to secure function of the sphincter a communication between the vagina and rectum just above the anal sphincter can be made and the vaginal outlet closed. This procedure, advocated by Keen, is probably the best. Peterson collected 41 cases in which the operation was performed with comparative success.

Seventy-eight cases of vesicovaginal fistula have been operated on in the Clinic since 1908. In 54 of these it was possible to close the fistula in one operation; in 16, two operations were performed; and in 1, six operations failed completely to close the fistula. The size of the fistulous opening in these cases varied from that of a small pin point to complete eversion and prolapse of the bladder.

In 3 of the cases there was more than one opening. A large incision in the vaginal wall included all the openings and converted the operation into a single closure after the openings into the bladder had been closed separately.

The bladder sphincter was involved in 10 cases, but was destroyed in only 3. In 7 cases it was repaired quite satisfactorily.

One of the ureters was involved with the vesical fistula in 6 cases. The position of the ureter should always be determined and in some cases in which it is involved in the fistula the suprapubic operation is the operation of choice.

Legueu has recently advocated the transperitoneal vesical route for vesicovaginal fistula. This procedure has some advantages in cases in which the fistulous tract becomes attached to the pubic bone and is thus held in a most inaccessible position for use of the vaginal route.

If the fistulous opening is small, the fistula may be inverted into the bladder and held there by tension on the purse string suture which is pulled out through the urethra. This procedure is described by C. H. Mayo. A number of small vesicovaginal fistulae have been closed by the high frequency current.

Before operation the tissues should be made as near normal as possible. A cystoscopic examination should be made to determine the position of the ureters, the presence or absence of a sphincter muscle, and whether or not the bladder has been completely severed from the urethra. When the injury is near the neck of the bladder the vaginal operation is the procedure of choice. When the opening is high in the vaginal fornix and there is much scar tissue the suprapubic operation may be of service but more room may be secured for the vaginal exposure by incising the perineum. A long incision should be made in the vaginal wall down to the bladder, beginning below the sphincter muscle and extending to and through the fistulous opening. The bladder should then be separated from the vagina, the separation being begun near the cervix and brought forward toward the urethra. If the cervix has been removed and the fistula is high in the vagina the peritoneum may be opened as advocated by Kelly.

A small curved hæmostat passed through the urethra and into the vagina through the fistula helps to bring the fistulous tract downward into the dissection. When the bladder has been loosened and its edges can be easily approximated the opening should be closed with catgut and the edges of the mucous membrane inverted. The vaginal incision may then be closed with chromic catgut and all dead space obliterated. If the sphincter has been repaired it is best to use fine silk sutures in addition to the catgut, care being taken not to penetrate the mucous membrane with the silk. A retention catheter should be left in the bladder for from eight to ten days and the patient kept quiet for from twelve days to two weeks.

There were no deaths in the series of cases reviewed. Of 56 patients heard from, 4 have not been benefited by the operation, the condition of 6 is considerably improved, and the rest have been completely cured.

## MISCELLANEOUS

**Wright, F.: Hypertension in a Woman at the Menopause.** *Med. Clin. M. Am.*, 1920, iii, 1735.

Wright reports a case in which corpus luteum injected muscularly caused uterine hæmorrhage in a woman of 50. The patient developed excessive menstruation, high blood pressure, vertigo, and severe headache, all of which became gradually worse over a period of seven and a half years.

As there were no renal findings radium was introduced into the uterus to induce the menopause, with the result that all of the symptoms were greatly relieved. The history is summarized as follows:

1. A high blood pressure was tolerated for some time.

2. Nervous influences distinctly affected many of the symptoms.

3. Arterial changes developed gradually, as shown in the eye, the coronary arteries, the uterus, and possibly the abdominal aorta.

4. The kidney had little to do with the difficulty.

5. The endocrine influence was a factor but probably only one of several.

6. Cessation of menstruation in such cases is warranted if the progression of symptoms demands it.

EUGENE CARY.

**Robins, C. R.: The Operative Treatment of Pelvic Inflammation.** *South. M. J.*, 1920, xiii, 368.

The author's conclusions are based on a study of more than 500 cases of pelvic inflammation. These cases he divides into two classes: (1) puerperal or post-abortion inflammations, and (2) gonorrhœal inflammations. The first class of cases he treats conservatively in the acute stages and merely drains the abscess pockets. Regarding the second class he states that operation may be performed at any stage but does not say definitely whether he considers operation desirable.

In the chronic cases operation offers little hope of curing sterility. Dysmenorrhœa and other pain is to be attributed to adhesions about the ovaries. Robins expresses satisfaction with conservative operations in which only the tubes are removed, the ovaries are freed from adhesions, and the uterus is suspended anteriorly. Emphasis is laid upon the importance of preserving menstruation.

Robins therefore differs from those who believe that chronic cases of pelvic inflammation should be treated by local rather than surgical measures unless a radical operation is contemplated. W. H. CARY.

**Bland, P. B.: Mercuric Chloride Poisoning from Vaginal Injections—Two Fatal.** *J. Am. M. Ass.*, 1920, lxxiv, 1227.

Vaginal irrigations are of value in the local treatment of acute and chronic affections, but carelessly given may cause extensive local organic destruction and occasionally death. The author reports three cases as follows:

**CASE 1.** The patient was a woman 29 years of age. Menstruation had begun at the age of 20. The menstrual periods had always been regular, recurring every twenty-eight days, and were not associated with pain. The discharge continued for four or five days, was always rather profuse, and frequently contained clots. The patient married at the age of 21 and had had three pregnancies, all of which continued to term and terminated normally. Suturing had never been necessary.

Four weeks prior to the patient's admission to the hospital she had taken a copious douche of hot water to which two "blue tablets" (mercuric chloride) had been added. These were employed to prevent conception. Very soon after the irrigation violent burning pain began in the vulva and vagina. Various agents to overcome this pain were prescribed by the patient's family physician but were of no benefit. The following day the vulva became intensely swollen and red and urination was difficult and extremely painful. This condition persisted for several days, becoming associated later with a profuse seropurulent discharge which frequently contained long shreds and membrane.

Four weeks after the douche was taken the vulva were still somewhat swollen and inflamed. The vagina showed most striking changes. The canal was almost completely closed. The mucosa had entirely sloughed away and the tube was lined by a red, resistant, tender, granular membrane. There were no marked constitutional symptoms at any time. Operative measures were recommended for the vaginal stenosis but were refused. No further record was obtained of the case.

**CASE 2** was that of a woman aged 21. The patient first menstruated at the age of 17, one year subsequent to her marriage. Menstruation had always been regular and of the twenty-eight-day type. The flow was scanty and extremely painful. The last period occurred approximately two months previously.

Two days before her admission to the hospital the patient took a douche in order to prevent conception. To the douche solution she added a teaspoonful of "white powder" (mercuric chloride). One quart of water was used. Immediately after the irrigation she was seized with a violent burning pain. The family physician applied oils and gave an alkaline douche but this treatment gave only temporary relief and the following day the vulva became greatly swollen and discolored. The pain was intense. Shortly afterward a profuse seropurulent discharge appeared which later contained particles of tissue.

The patient was rather delicate and was suffering great agony. The pupils were normal. The lips were parched, dry, and cracked. The tongue and pharynx were extremely red and dry. The mucous membrane throughout the throat was intensely injected. The lungs were normal. The heart presented a moderately loud systolic murmur and



its rate was rapid. The abdomen was somewhat distended and rather resistant and tender, especially above the pubic arch. The vulva were extremely swollen, red, and tender. The labia were pendulous and oedematous. The vaginal orifice was covered with a yellowish green exudate. A profuse seropurulent discharge, foul and offensive, was pouring from the vaginal opening. Digital examination was attempted but was impossible on account of the intense pain. The temperature was normal. The pulse rate ranged from 100 to 130. The respiration was practically undisturbed. The urine contained a large amount of albumin, a great variety of casts, and a large number of red and white blood cells. The general systemic symptoms became worse and death resulted from complete suppression of urine seven days after the patient was admitted to the hospital.

CASE 3. The patient was a woman of 28 who had always been in good health and had never had any serious disease. Menstruation began when she was 13 and was regular. The menstrual periods lasted for three or four days. The flow was associated with pain on the first day but there were no clots. The last period occurred October 13, approximately three months before the patient's admission to the hospital. She had been married at the age of 22 and had had three pregnancies. The first terminated in spontaneous abortion at the end of five weeks. The second continued to full term and was terminated normally. The third conception occurred October 13, 1919, and the pregnancy was terminated by induced abortion Jan. 8, 1920.

The present illness began Jan. 8, following a uterine irrigation with a solution to which the patient had added two "tablets" (mercuric chloride). The douche nozzle was carried deliberately into the cervical canal and the irrigation solution was allowed to flush the interior of the uterine cavity. Immediately thereafter sharp abdominal pain developed. This was intermittent, occurring at intervals of about five minutes. Abortion occurred the following day. A fetus 3 in. in length was expelled and the placenta and membranes came away one hour later. Subsequently vomiting and diarrhoea developed and the patient suffered a rather violent chill. There was a profuse bloody discharge and general pain in the joints. Urinary excretion became extremely slight, the skin extremely dry and the mouth cracked and parched. The patient's family physician treated her for suppression of urine and uræmia by placing her in hot packs. He was not informed by the patient or her husband of the true state of affairs.

The patient was admitted to the hospital with complete urinary suppression which had persisted

for twenty-four hours. No urine was passed for four days subsequent to her entrance into the hospital. Uncontrollable diarrhoea and vomiting were more or less constant. The patient complained of restlessness, a violent headache, and burning in the region of the vagina and bladder. The mouth was swollen, the teeth were tender, and the breath was extremely offensive. The eyes were normal. The lips were dry and cracked, and the tongue was dry, coated, and furred. The throat was injected. The lungs were normal. The heart action was regular and no adventitious sounds were heard. The abdomen was somewhat distended and tender over the kidneys and low down in the mid-line. The mucous membrane of the vagina was normal. There was a seropurulent discharge from the uterus. The cervix was patulous and allowed the introduction of the finger. A slough of endometrium was removed during the examination. Death occurred two weeks after the patient's admission to the hospital.

The last specimen of blood was taken the morning the patient died. The differences in the non-protein nitrogen, urea nitrogen, and creatinine content of this specimen as compared with normal blood are shown in Table 2.

TABLE I. BLOOD ANALYSES

	Mg. per 100 ccm. Whole Blood		
	Jan. 14	Jan. 18	Jan. 23
Non-protein nitrogen.....	204	330.4	370.3
Urea nitrogen.....	97.3	102.6	152.5
Creatinine.....	10.6	11.1	11.6

TABLE II. DIFFERENCE BETWEEN PATIENT'S BLOOD AND NORMAL BLOOD

	Normal Mg.	Patient's Blood Mg.	Diff. Mg.
Non-protein nitrogen.....	25-35	370.3	335.3
Urea nitrogen.....	12-23	152.5	129.5
Creatinine.....	1-2	11.6	9.6

A complete blood count on January 10 revealed 3,130,000 red cells and 15,800 white cells. The hæmoglobin was 60 per cent and the color index 0.91. The red cells appeared to be normal. The differential count was as follows: polymorphonuclear neutrophiles, 98 per cent; polymorphonuclear eosinophiles, 2 per cent; polymorphonuclear basophiles, 0; small mononuclears, 9 per cent; and transitionals, 0.

On January 18 the differential count was: polymorphonuclear neutrophiles, 94 per cent; polymorphonuclear eosinophiles, 2 per cent; polymorphonuclear basophiles, 0; small mononuclears, 2 per cent; large mononuclears, 1 per cent; and transitionals, 1 per cent.

W. F. HEWITT.

# OBSTETRICS

## PREGNANCY AND ITS COMPLICATIONS

**Cornell, E. L., and Stillians, A. W.: Syphilis in Pregnancy and Labor.** *Am. J. Syphilis*, 1920, iv, 342.

There is considerable difference of opinion relative to the prevalence of syphilis among pregnant women. According to some authors the incidence is as high as 16 per cent, while according to others it is as low as 3 or 4 per cent. This wide difference is due to the source of material upon which the percentages are based.

Every pregnant patient entering the Chicago Lying-In Hospital and Dispensary Clinic is given a Wassermann test. In the charity field this work more nearly resembles private practice than that of most dispensaries. If the higher percentages given for syphilis in pregnancy are correct, many physicians are failing in their diagnoses.

At the time this article was written 69 patients had been tested. Of these, 2 gave a strong positive and 1 a slight positive reaction (4.34 per cent). All of the positive reactions were those of colored women, and as there were 6 colored patients, 50 per cent of the total number were syphilitic.

Eighteen of the 69 patients (26 per cent) gave a history of abortion or stillbirth. Of the 3 syphilitics, 1 had aborted. The reason for this large number of abortions is not clear. One-third of all the pregnancies resulted in abortion or stillbirth. It is possible that a few more of the patients had syphilis in spite of negative Wassermanns.

Among the poor, abortion may be due to unfavorable living conditions and lack of prenatal care. In many instances also it may be traced to other causes such as poor teeth, infected tonsils, chronic appendicitis, low-grade gall-bladder disease, etc. Among the private patients, 19.6 per cent gave a history of abortion or stillbirth.

EDWARD L. CORNELL.

**Hoffmann, K.: Appendicitis in Pregnancy** (Zur Frage der Appendicitis in graviditate). *Arch. f. Gynaek.*, 1920, cxii, 230.

From his study of 39 cases of appendicitis in pregnancy the author is convinced that the elevation of the cæcum is not always so severe as Fuhs reports. Furthermore he believes that a definite relationship between the tension of the abdominal walls, the size of the uterus, and the elevation of the cæcum cannot be determined and that a definite diagnostic point for the elevation of the cæcum may be gained only by the use of the X-ray after a contrast meal. This procedure is impossible in acute cases. The author recommends early operation for the first attack of appendicitis during pregnancy as well as

for recurring attacks. The site of the incision should be determined from the clinical symptoms and signs.

RAESCHKE (Z).

**Tweedy, E. H.: The Treatment of Antepartum Hæmorrhage.** *Med. Press*, 1920, n.s. cxix, 393.

In opening a discussion at the Royal Society of Medicine Tweedy stated that a comparison of the results in accidental hæmorrhage is difficult because in the compilation of different statistics different standards have been adopted. In the Rotunda Hospital the term is not now used unless the bleeding is sufficient to make it necessary to call an assistant master to make a diagnosis and assume the responsibility for the delivery. The assistant master is not summoned unless his presence is required in the interest of the patient. Therefore many insignificant bleedings escape the records. During his mastership of the Rotunda, Tweedy reported only 49 cases of accidental hæmorrhage and 45 of unavoidable hæmorrhage in 13,024 deliveries. In the extern maternity there were 47 cases in 15,543 deliveries.

On the other hand, Sir William Smyly, adopting a different standard, in his first hospital report on 3,600 deliveries recorded 44 cases of which he wrote, "Most of them were of little consequence." Similarly, at St. Mary's Hospital, Manchester, 105 cases of accidental hæmorrhage were encountered in the two years 1913-14. Eighty-three of these patients recovered under the measures applicable for the condition in its less severe form (rupture of membranes, etc.). Seven died in spite of this treatment and 15 were dealt with by more radical procedures. From these figures Tweedy infers that there were certainly 22 serious hæmorrhages, but that the remainder might be classed with most of Sir William Smyly's cases as "of little consequence."

Among Tweedy's 49 patients 22 were in serious danger and were treated by the use of the vaginal plug. He lost 2 hospital and 7 extern maternity patients, 5 of whom were treated with the plug. The 2 hospital deaths were due probably to intraperitoneal hæmorrhage for in one case not more than a pint and a half of blood poured into the uterus, and in the other the patient's condition improved while the plug was in place and death did not occur until after the completion of the third stage three hours later. From 1913 to 1918, during which time Tweedy was again at the Rotunda Hospital, 23 cases of accidental hæmorrhage were treated. By that time the possibility that accidental hæmorrhage might arise as a result of pregnancy toxæmia had been established. Cæsarean section was therefore performed when the double complication was encountered in a severe form.



The procedure was carried out three times with success. Intra-abdominal blood was observed in all of these cases, and in 1 the ovarian artery beneath the fallopian tube was bleeding. In the remaining cases, the plug was used in 8. No deaths occurred from loss of blood. One woman died from sepsis ten days after delivery. Tweedy's hospital experience therefore comprised 72 cases in over 18,000 deliveries, with 2 deaths. The plug was used in 30 cases. Sir William Smyly, working in the same institution, had 5 deaths among 3,600 patients treated before he adopted the plug. These figures are convincing and can be explained only by the assumption that the plug exercises a pronounced influence on hæmorrhage. Tweedy maintains, however, that compression is effected with the plug which he applied as he has demonstrated this during the performance of several cesarean sections. These operations afforded his assistants an opportunity to observe directly the stoppage of pulsation in the uterine artery while pressure was made from below. Tweedy describes his method of plugging as follows:

To plug efficiently the left hand should be passed into the vagina with the palmar surface directed toward the hollow of the sacrum while the tips of the fingers lie behind the cervix. Small pieces of cotton wool squeezed out of lysol solution and each the size of the thumb-knuckle should then be inserted round the cervix with the right hand. The fingers of the left hand must be kept busy squeezing the pellets into a compact mass and forcing the spaces between them to permit the insertion of another plug. This process should be continued in a systematic manner from above downward until the vulva is reached and the vagina can hold no more. A T-bandage should be applied to keep the plug in position, and an abdominal binder fastened tightly from above downward to press the side walls of the uterus against the vagina dam. A plug so applied will cause immediate cessation of hæmorrhage, and when it is removed after the lapse of hours the blood found will be only such as can be accounted for by the flow that took place during the operation.

The vaginal plug is not easy to apply nor is its application harmless. If at the first attempt sufficient material cannot be inserted to stop the bleeding, the plug must be removed entirely and reinserted, a procedure made easier by the dilatation of the vagina. Pain, distress, and some shock always follow the application of the plug, and superficial tearing of the mucous membrane of the vagina is almost certain. The possibility of rupture of the uterus must not be discounted. To what extent intraperitoneal hæmorrhage can be controlled by a vaginal plug is still a matter of doubt. In the vicinity of the internal os control is complete. On the other hand the plug will fail utterly to stop a leakage from the ovarian artery. The latter supplies a relatively small amount of blood to the placenta, chiefly to its upper portion where

detachment is rare. When the main supply is cut off the loss of blood pressure promotes coagulation in the sinuses.

Tweedy maintains that hysterectomy has no place in the treatment of accidental hæmorrhage. Rupture of the membranes does not contra-indicate the use of the vaginal plug. C. H. DAVIS.

**Dougal, D., and Bride, J. W.: Etiological Factors in Abortion: A Study of 100 Cases. *Brit. M. J.*, 1920, i, 632.**

This study is based on 100 unselected cases of abortion at the Maternity Department of St. Mary's Hospital, Manchester. Both clinical and pathological examinations were made except in cases of incomplete abortion when the whole ovum was not obtainable.

In the majority of cases the period of gestation at which abortion occurred was during the first half of pregnancy; in 40 per cent, between the third and fourth months.

Seventeen per cent of the patients had had no previous pregnancy. Eighty per cent had had full-term children and 37 per cent. more than three pregnancies. Forty per cent gave a history of previous abortions, but more than half of these had had only one.

The cause of the abortion as given by 28 patients was as follows: strain in 7 cases, falls in 6, lead pills in 8, shock in 2, a kick in the abdomen in 1, injury to the foot in 1, instruments in 1, syringing in 1, and sexual excess in 1. Excluding these cases, various abnormal conditions were found either at clinical examination or at the time the uterine contents were evacuated. Of 22 patients in this group 5 had retroversion or flexion of the uterus; 2, fibroids; 3, previous abdominal operations; 3, influenza; and 2, placenta prævia. Seven patients had one of the following conditions: mitral stenosis, chronic bronchitis, pulmonary tuberculosis, severe anæmia, fibroids and placenta prævia, hydatid mole, and foreign body in the vagina. Positive Wassermann reactions were found in 12 cases. In 6 of these no other cause for the abortion could be determined. Thus a possible cause of the abortion was ascertained in 56 per cent of the cases.

The gross pathologic findings in 54 cases were as follows: hæmorrhage into the decidua (including 2 cases of fibroid polyp, 1 placenta prævia, and 8 blood moles), 33; hæmorrhage into the placenta (including extensive placental infarction with associated arterial degeneration), 6; obstruction of foetal circulation, 2; hæmorrhage on the foetal surface of the placenta under the amnion, 2; hydatid mole, 1; and oedematous, placenta, 1. In the remaining cases the conditions were either too limited in extent to be of decisive importance or the specimens were so incomplete that satisfactory findings could not be obtained.

In an analysis of the 12 cases which gave a positive Wassermann reaction it was found that 11 of the patients previously had had full-term children.



The children were born alive except in 1 case in which 3 were stillborn. Repeated abortions are not necessarily associated with a positive Wassermann. Abortion had occurred previously in 6 cases, but in only 1 more than once. In 7 of the 12 cases there were other abnormal conditions which might be the cause of the abortion. The authors feel justified in saying that syphilis was not the cause of the abortion in a case of adherent caesarean scar and in another of fibroid polyp. In a case of retroflexion of the uterus and a case of obstruction of vessels in the umbilical cord it is considered improbable that syphilis was the deciding factor. The number of cases in which syphilis leads to abortion may therefore be estimated at 10 per cent and probably less.

In their conclusions the authors further correlate their findings on the etiology. In 18 per cent of the cases accidental or reflex causes were present. In 25 per cent there was general disease of the mother, disease or displacement of the maternal genital organs, and gross abnormalities of the foetus or placenta (other than those due to hæmorrhage or infarction). In 12 per cent of the cases a positive Wassermann reaction was obtain, but the influence of syphilis as the actual cause of the abortion may be judged as nearer 8 per cent. The figure for the group of self-induced abortions is probably not less than 20 per cent. Thus in more than 30 per cent of the cases the cause was not evident, and pathologic investigation throws little additional light on the subject as most of the morbid changes present were not those which produce abortion, but changes which occur during the operation of some other cause.

It would appear, however, that the mother is primarily at fault because of some disease condition of an organic nature or merely an increased irritability of the centers governing the expulsive action of the uterus.

J. E. McCORVIE.

**Brodhead, G. L.: Pregnancy in the Rudimentary Horn of a Bicornate Uterus.** *J. Am. M. Ass.*, 1920, lxxiv, 1453.

Brodhead quotes Lee's statements that over 100 cases of pregnancy in the rudimentary horn of a bicornate uterus have been reported since 1669, and that while the gestation sac usually ruptures early, with hæmorrhage and symptoms much like those of ectopic pregnancy, the ovum may grow to term.

The author's patient entered the hospital apparently in labor in the eighth month of gestation. A midwife had concluded that the foetus was dead. After several hours of mild pains, the patient suddenly went into collapse and died in a few minutes.

At autopsy a foetus weighing  $4\frac{1}{2}$  lbs. was found free in the abdominal cavity. The foetal sac, measuring 18 cm. in diameter, was connected by a pedicle 1 cm. in diameter to the left aspect of the uterus at about the level of the internal os. The left ovary and the fimbriated end of the tube were attached to the foetal sac. Drawings and pathologic data are given.

W. H. CARY.

**Rivière, M., and Lacouture, J.: Primary Abdominal Pregnancy Subsequent to a Caesarean Operation** (Grossesse abdominale primitive chez une femme ayant subi antérieurement l'opération césarienne). *Rev. franç. de gynéc. et d'obst.*, 1920, xv, 43.

The patient had had a caesarean section about a year previously because of a contracted pelvis. In April, 1919, menstruation ceased but there were no other symptoms of pregnancy. Five or six months later a peritoneal crisis occurred which was followed by colicky uterine attacks twice a month with sudden increase in the size of the abdomen. The condition was at first thought to be hæmatometra, but on palpation the uterus was found to be small, in retroflexion, and without any gestation changes. A medianly situated neoplasm led to a diagnosis of malignant ovarian tumor of rapid growth.

On laparotomy a macerated 5-months foetus enveloped in an amniotic sac adhering to the intestine was discovered in the peritoneal cavity. The placenta was adherent and fixed in the right iliac fossa. The ablation of the placenta, which was done without difficulty and without hæmorrhage, was followed by hysterectomy.

In the scar of the caesarean incision the mucosa alone appeared intact the muscular edges having failed to unite. The tubes were much altered, the right being completely obliterated.

In the authors' opinion the condition was a primary abdominal pregnancy as it does not seem probable that the placenta would have been expelled at five months and then grafted in the iliac fossa. The lesions of the tube through which the spermatozoa penetrated into the abdominal cavity did not permit the fecundated ovum to enter the tube and from thence pass into the uterus.

W. A. BRENNAN.

**Bourne, A. W.: A Lecture on the Toxæmias of Pregnancy.** *Brit. M. J.*, 1920, i, 727.

The author states that the toxin produced almost certainly by the growing ovum during pregnancy is absorbed by the maternal circulation. The ovum constantly poisons the mother, but in all healthy women most of the toxin is effectively countered by their own immunizing efforts. Schmoil proved that foreign foetal protoplasm is conveyed into the maternal circulation when he demonstrated the presence of small pieces of syncytial protoplasm in the circulation.

A biochemical defence is set up by the maternal tissues to battle the invasion. Abderhalden demonstrated that the maternal blood contains a specific ferment capable of digesting placental protein during pregnancy and for ten days afterward. Theis and Lockemann also showed that maternal serum is sensitized to certain bodies in the foetal serum and placenta. This has been borne out also by the laboratory work of Young who, by the injection of placental extracts, produced experimental toxæmia in animals, the symptoms and postmortem appear-



ances of which were almost indistinguishable from those of eclampsia.

Early eye changes are usually significant of chronic nephritis rather than the toxæmia of pregnancy. The differentiation is important for the prognosis and treatment. Retinitis is one of the more serious symptoms of albuminuria, and if this condition indicates a pre-existing disease of the kidney rather than an albuminuria due to pregnancy, the safest course is to end the pregnancy as soon as possible. Permanent damage to the kidney and lasting changes in the retina may thus be prevented.

The blood pressure is some measure of the degree of the toxæmia and an indication of the likelihood of convulsions. If the blood pressure falls to a low level while the patient is under treatment, and the other symptoms clear up, an expectant attitude may be continued. If it remains high, eclampsia may be expected. An increase in the amount of albumin during treatment as determined by Esbach's tube shows that the condition is not under control. If the albumin disappears rapidly and completely the symptoms were due to the toxæmia of pregnancy and the prognosis for the immediate and for future pregnancies is good. If the amount of albumin remains high and persists during the puerperium, chronic nephritis is indicated, the kidney has been damaged, and the prognosis for future pregnancies is not good.

In cases of eclampsia a few slight convulsions with coma are usually followed by recovery, but the prognosis becomes worse if the convulsions increase in number and severity or if coma develops. The earlier in pregnancy the convulsions occur the more severe is the disease. Antepartum convulsions are more dangerous than intrapartum or postpartum convulsions. The heart action should be watched during toxæmia as it may have a deleterious action upon the heart muscle. Venesection and the administration of massive saline injections and veratrine should be based on the condition of the heart. In the cases of multiparæ, labor should usually be induced by means of a bag, but if it is already established, it should be interfered with only if it is delayed. Delayed labor, however, is not common in eclampsia. A primigravida at term who develops convulsions without dilatation of the cervix and does not pass urine will probably improve if the child is removed by abdominal cæsarean section.

Veratrine is of value to reduce the blood pressure and pulse rate. An initial dose of 1 ccm. should be given when the tension is 170 or more and there is a correspondingly rapid pulse. This dose often causes a rapid fall in the blood pressure with cessation of the convulsions. Estimations of blood pressure every hour will aid in determining the time for the next injection, which usually should be 0.5 ccm. or even 0.25 ccm., according to the level of the tension.

The colon should be irrigated until the washings are clear. Free sweating may be induced by hot packs, electric lamps, or hot bottles. Saline injections containing glucose and sodium bicarbonate up

to a maximum of 2 pt. may be given within the first four hours. Rectal injections may be continued if there is free sweating and an increasing output of urine. After twelve hours or more of this treatment the patient is usually in much better condition and ready for the induction of labor or any obstetrical operation. There should never be any violent interference such as accouchement forcé by the vaginal route. Forceps, version, bags, and the bringing down of a leg, or cæsarean section may be employed.

W. E. COSTLOW.

**Bell, W. B.: The Treatment of Eclampsia by Transfusion of Blood.** *Brit. M. J.*, 1920, i, 625.

In the hope that his success may stimulate others to give the method a trial the author describes a case of eclampsia which he treated by transfusion of blood.

After reviewing the facts demonstrated experimentally by Dold and Obata, Bell concluded that normal blood contains some substance which neutralizes the toxin of placenta and is present alike in the blood of males and females. On this assumption he gave the patient a transfusion of about 500 ccm. of blood by the citrate method. The donor was the patient's husband.

The patient was a primigravida, 24 years of age, in the ninth month of gestation. She had been delivered with forceps at 11:30 p. m. after having had several convulsions. At 10:30 a. m., when the transfusion was given, she was almost completely comatose. There had been several convulsions after delivery and her condition was critical.

The recovery in this case was remarkable. Before evening the patient was quite rational and able to converse. The urine, which had contained acetone and albumin, soon became normal; the ammonia coefficient dropped from 22 to 4.8.

In some cases it may be necessary to repeat the transfusion. The author suggests bubbling oxygen through the citrated blood instead of shaking it. The use of a human antitoxic serum might simplify the treatment.

J. W. ROSS.

**Holland, E. L.: On the Rupture of the Cæsarean Section Scar in a Subsequent Pregnancy or Labor.** *Med. Press*, 1920, n. s. cxix, 394.

No accident is more disturbing to the peace of mind of the obstetrical surgeon than the rupture of the scar of a cæsarean section. It therefore seems imperative to get at the true facts not only regarding the cause of such rupture, but also regarding its frequency. If the risk is proved to be negligible, obstetrical surgeons may continue to perform the operation according to its modern indications with a clear conscience, but if the risk is appreciable, safety must be sought either by restricting the indications for the operation or by devising a new and safer technique.

Holland gives a few important points regarding the anatomy of the ruptured scar and the chief factors responsible for its causation. Perfect healing



of the uterine wound results in complete muscular regeneration; imperfect healing, in thin scars composed of fibrous tissue which sometimes are so thin that they consist of little else than peritoneum and endometrium or decidua with a small amount of intervening fibrous tissue. In the latter type of scar the outstanding feature is complete failure of muscular union. It is, of course, these thin scars which are apt to rupture in future pregnancies. Owing to the progressive distension of the pregnant uterus the scar becomes thinner and thinner and may ultimately give way under the tension of normal pregnancy or the additional stress of labor.

The author has been able to collect 92 cases from the literature and reports 5 of his own, making the total number of cases on record, 97. A study of these cases makes it evident that infection of the uterine wound was by far the most important factor in imperfect healing. If the uterine wound suppurated, necrosis often occurred and the sutures were cut out, the muscular edges of the incision being allowed to retract so that ultimately only a thin bridge of fibrous tissue covered by peritoneum and endometrium inside was left. In the cases so far reported the recovery from cesarean section was febrile or infection of the uterine or abdominal wounds was noted. Infection was present in 51 of 66 cases in which this point was mentioned. A very important accidental factor in rupture was the implantation of the placenta over the scar in subsequent pregnancies. Among 50 published cases, in which the point was noted, this occurred in 33. In Holland's opinion, the action of the placenta in favoring rupture lay in the occurrence of retroplacental hæmorrhage due to the separation of the placenta from the gradually stretching scar. In only 17 of the 97 cases were such accidental factors reported as over-distention of the uterus by hydramnios or multiple pregnancy, straining of the scar by obstructed labor, or operative interference such as version. A most important fact was that in the 53 reported cases in which the material used for suturing the uterine wound was mentioned, catgut was used in 41 and silk in 12.

As the result of the assistance of the obstetrical surgeons he had asked to co-operate with him in this investigation, Holland was put in possession of the subsequent reproductive history of 1,089 patients on whom cesarean section had been performed between the years 1912 and 1918 inclusive. The lists of these cases were sent to him complete in every essential detail. The total number of operations performed was 1,588 and there were 70 per cent of successful follow-ups.

Of these 1,089 patients, 610 had remained sterile and 479 had become pregnant subsequent to the operation. The results of the pregnancies were as follows: delivery by the natural passages, 79; repeated cesarean section, 326; abortion, 42; pregnant now, 91; and rupture of scar, 18. By adding the pregnancies and deducting the abortions and the number of cases of early pregnancy the true

frequency of rupture of the scar in this large series of patients was found to be 4.3 per cent.

Perhaps the most important point of all to settle is whether rupture of the scar is more apt to occur after the use of catgut than after the use of silk in the suturing of the uterine incision. The lists of operations revealed the fact that catgut is used much more frequently than silk, catgut having been employed in 66 per cent, silk in 20 per cent, and silk-worm gut in 14 per cent. In the 18 cases of rupture, catgut had been used for the original operation in 15 and silk in 2. To obtain the most exact information on this subject, however, it is necessary to find out in what proportion the two materials were used in those cases in which the subsequent pregnancy had gone to, or nearly to, full term. It was discovered that catgut had been employed in 279 such cases and silk in 91 and that 15 ruptures had occurred in the former group (an incidence of 1 in 18) and 2 ruptures in the latter group (an incidence of 1 in 45). Therefore the liability to rupture after the use of catgut is two and a half times the liability after the use of silk. Catgut might or might not be a suitable material in cases of aseptic healing of the uterine wound, but asepsis of the wound cannot be guaranteed as in cesarean section the incision is made into a mucous cavity in close proximity to a contaminated area, i.e., the vulvovaginal tract. In Holland's opinion, therefore, the use of catgut as a suture material in cesarean section incision is doomed.

C. H. DAVIS.

#### PUERPERIUM AND ITS COMPLICATIONS

**McNeile, O.: Comparison of the End-Results in Intermediate and Secondary Perineorrhaphies.**  
*California State J. M.*, 1920, xviii, 179.

McNeile reports 100 cases in which an immediate or a secondary perineorrhaphy was done and concludes that the immediate operation is the procedure of choice.

Natural and artificial causes of lacerations of the birth canal are considered. Among these the author mentions the admixture of races which so changes the shape of the child's head that it will no longer pass through the pelvis without injury to the perineum. In support of this view he cites the fact that the pure-blooded Japanese women rarely sustain cervical or perineal tears.

Artificial causes of lacerations include: too early bearing down; the use of forceps and operative procedures before obstetrical conditions warrant; the administration of pituitary extract without accurate knowledge of the conditions; the improper use of anesthetics; unskilled mechanical retardation of the advancing head; and in general, the tendency to hasten labor.

The importance of a normal perineum cannot be overestimated. Semi-invalidism in later life is often the result of unrepaired perineal injuries.

Immediate repair gives at best a mediocre result on account of the cedema and distortion of the



tissues. The intermediate operation, which should be performed from the second to the eighth day postpartum, is to be preferred in all cases in which the muscles or fascia are involved.

The only preliminary necessary for the intermediate repair is a low 1-qt enema given three hours before the operation. No laxative should have been given during the previous twenty-four hours. The local preparation consists of the application of 2 per cent tincture of iodine to the perineum, vagina, and cervix after the patient has been anesthetized.

A weighted, self-retaining speculum is inserted and the cervix grasped with two ring-type sponge holders and brought down into the field for inspection. Recent lacerations are brought together with interrupted sutures of No. 2 chromic catgut. Old lacerations are brought together in the same manner but are first denuded and trimmed. The cervix is replaced, being pushed well upward and backward to counteract the tendency toward retroposition of the uterus, and a flat dressing is inserted into the vagina to prevent soiling of the perineum by the lochia.

An Allis snap is placed on each side at the juncture of the skin and mucosa at the level desired, usually just below the lower level of the labia minora. The tissue between these two snaps is drawn taut and a narrow strip of tissue including both skin and mucosa is cut off. In recent lacerations this step is not necessary as there is already an open tear. A closed Mayo scissors is introduced into this line of cleavage about  $\frac{1}{2}$  in. from the median line, pushed back, down and out for about  $1\frac{1}{2}$  in., and opened so that the blades are separated about 2 in. This step is repeated on the opposite side. The mucosa directly in the median line is dissected backward for about  $\frac{1}{2}$  in. In recent tears this dissection is not necessary. In cases presenting a large rectocele, however, a more extensive denudation and resection may be required. Allis snaps are introduced into the two lateral openings and a thick bundle of the levator ani muscle is grasped, drawn into the field, and sutured in the median line with No. 2 chromic catgut. Usually two or three sutures are sufficient. This forms the basis of the new pelvic floor. The mid-point of the cut edge of the vaginal mucosa is grasped with an Allis snap and the vaginal mucosa and underlying tissue are approximated with three or four sutures of No. 1 plain catgut.

No. 2 chromic catgut on a medium-sized cutting needle is used for skin suturing. These needles are passed through the skin so that they catch the fascia underneath and are then brought out through the tissues of the opposite side in the reverse order.

After the operation the stitches are washed once a day with a non-alcoholic solution of green soap, preferably after the morning bowel movement. After urination the stitches are dried with gauze sponges. No external douching is allowed. Heroin, gr.  $\frac{1}{24}$  to  $\frac{1}{12}$ , is given every four hours for twenty-four hours, beginning when the patient returns from

the operating room. During this period the baby is not permitted to take the breast.

The following averages have been computed on a series of repairs half of which were of the secondary type of operation and half of the intermediate type:

RESULTS IN 100 PERINEORRHAPHIES		
	Intermediate	Secondary
Average age.....	27	30
Primiparæ.....	31	12
Multiparæ.....	19	38
Day after delivery.....	3	
Time of operation (min.).....	18	24
Cervix only.....	1	0
Cervix and perineum.....	37	33
Cervix, perineum and posterior colporrhaphy.....	12	3
Perineum only.....	0	8
Delivery		
Normal.....	42	43
Forceps.....	5	7
G Version.....	2	0
Breech.....	2	0
Complications		
Episiotomy.....	2	
Pneumonia.....	1	0
Nephritis.....	2	0
Mastitis.....	0	1
Bartholinitis.....	0	1
Cystitis.....	0	6
Results		
Excellent.....	32	23
Good.....	14	19
Fair.....	2	8
Uterus		
Normal position.....	38	42
Retroverted.....	10	4
Not examined.....	2	4
Anæsthetic		
Gas.....	2	0
Ether.....	30	27
Gas-ether.....	18	3
Ether-scopolamine.....	0	20

EUGENE CARY.

#### NEW-BORN

**Boorstein, S. W.: The Treatment of Birth Fractures at the Fordham Hospital.** *Am. J. Dis. Child.*, 1920, xix, 375.

The author reviews the literature on the subject of the treatment of fractures in children and reports 6 cases from the Fordham Hospital. The method used in the treatment of the 6 cases was that which was introduced during the war for fractures of the femur and hand in the adult. The conclusions drawn are:

1. The Thomas-Jones splint can be used with safety in cases of birth fractures affecting the femur or the humerus.

2. It allows easier transportation, permits cleansing; and obviates the necessity for constant watching.

3. It permits early massage.
4. The deformity is easily controlled.
5. Union probably occurs earlier on account of the infant's ability to use the limb.

C. D. HAUCH.

**Schwarz, H.: Infant and Child Mortality, Including Miscarriages and Stillbirths.** *Am. J. Dis. Child.*, 1920, xix, 249.

The author's statistics cover ten years and were compiled from the social histories of families the average social status of which was that of a New York family with an income in prewar times between ten and eighteen dollars a week. In 6,968 of such families there were 27,711 pregnancies inclusive of stillbirths and miscarriages. Of these 27,711 pregnancies, 2,239 resulted in miscarriages and 413 in stillbirths. The remaining 25,059 represent the total number of children born alive. The percentage of children born alive in each family was therefore 3.6. The number of children born alive who died before one year was 3,232. From the first to the eighth year 1,081 additional deaths occurred, bringing the total number of deaths of children born alive to 4,313. Considering all deaths up to eight years, including miscarriages and stillbirths, it is

found that in 27,711 pregnancies death occurred in 6,965 (25 per cent).

Computed in terms of one thousand, the figures show that there were 80.7 miscarriages and 904.2 living births per thousand pregnancies. The infant death rate up to one year was 128 per thousand living births. In contrast to these figures is the death rate of only 70 per thousand among children in the same group of families who were under the author's care. This saving of 58 infants per thousand living births demonstrates conclusively what can be accomplished by care, supervision, and education.

A direct relation is shown between the percentage of miscarriages and the number of pregnancies per family. With 2 pregnancies per family the rate was 36.8 per thousand, while with 3 pregnancies it was 45.8 per thousand, and so on until in 85 families with 10 pregnancies the rate was 141.2 per thousand or more than 10 per cent of all pregnancies ending in miscarriages. In 16 families with 14 pregnancies, i.e., 224 pregnancies, there were 40 miscarriages (17 per cent). The stillbirth rate per thousand total pregnancies was 14.9.

The article is illustrated with a series of statistical tables showing the infant mortality up to the eighth year in relation to nationality and literacy.

H. K. GIBSON.



# GENITO-URINARY SURGERY

## ADRENAL, KIDNEY, AND URETER

Judd, E. S.: *Surgery of the Kidney. Minnesota Med.*, 1920, iii, 221.

Congenital anomalies affecting the kidneys are often very important from a surgical standpoint. The fused condition of horseshoe kidneys adds greatly to the difficulty of the removal of diseased portions. The congenital absence or the imperfect development of one kidney should always be determined before operation. In some cases it may be necessary to explore both sides before deciding on a nephrectomy. The organ may be displaced, either as an ectopic kidney in which the blood supply arises from the iliac vessels, or as a floating or movable kidney with normal renal vessels. A pelvic kidney may be normal, but is subject to the pathologic conditions that arise in a normally situated kidney.

As a pelvic kidney may simulate a number of lower abdominal conditions, a pyelogram should be made in all uncertain cases. In a series of 19 cases of pelvic kidney the kidneys in 10 were apparently functioning normally; in the other 9 they were diseased. The floating kidney is not in itself a definite surgical entity. It is only part of a general visceroptotic condition which will not be benefited by surgical intervention.

Contusion or rupture of the kidney may occur without any external evidence of trauma over the kidney area. The first symptom in most cases is hæmaturia. If this is severe and continuous, exploration is advisable. The rupture or tear may have involved the pelvis or ureter and early intervention may save the kidney from almost certain infection and destruction. Nephrectomy is often necessary in cases of severe injury.

Complete occlusions of the ureter cause atrophy of the kidney. Hydronephrosis did not develop in any case in which it was necessary to ligate the ureter. Neither was nephrectomy necessary. Hydronephrosis is caused by partial occlusion of the ureter due to stricture or the pressure of an anomalous vessel. If a large hydronephrosis is associated with a normal kidney on the opposite side, nephrectomy is advisable.

Surgical intervention is generally indicated in cases of pyogenic infection. Usually this condition is secondary to an infection of other organs. The organisms travel through the blood stream. Multiple abscesses in the cortex necessitate a nephrectomy.

Pyelonephritis and pyonephrosis are bilateral in most cases and are often complicated by prostatic enlargement and bladder stones. In cases of unilateral pyonephrosis nephrectomy is indicated.

Stone formations in the kidney are often found in combination with bilateral pyonephrosis. In these cases it is advisable to remove the stones from one kidney at a time, the second operation to be performed as soon as there has been complete convalescence following the first operation.

Calcareous deposits in the kidney may be multiple even though there is only a single radiographic shadow. The author makes an incision in the pelvis of the kidney sufficiently large to admit the examining finger during a pelviolithotomy. The suturing of this opening with fine catgut results in an earlier and more complete convalescence.

Tuberculosis of the kidney should be recognized in the early stages. When only one kidney is involved nephrectomy offers a favorable opportunity to remove the infection. The perirenal fat should be extensively removed and the cut end of the ureter isolated in such a manner that it will not infect the wound.

Benign tumors of the kidney are rare. Since hypernephroma develops slowly, good results may be obtained if a nephrectomy is done before the growth has broken through the capsule and extended to the surrounding tissue. In patients with large fixed tumors radium should be used.

Of 239 patients on whom nephrectomy was done in 1918, 7 (2.9 per cent) died. Three had tuberculosis of the kidney, 1 died of tuberculous bronchopneumonia, 1 of miliary tuberculosis, and 1 of chronic nephritis and bilateral pleuritis. Two of the patients had pyonephrosis; 1 died of hæmorrhage and 1 of thrombophlebitis. One patient with hypernephroma died of infection, and 1 with carcinoma of the kidney died of acute nephritis and metastasis in the lungs.

A. J. SCHOLL, JR.

Barney, J. D., and Welles, E. S.: *The Bacteriology of the Urine in Renal Tuberculosis. J. Am. M. Ass.*, 1920, lxxiv, 1499.

The authors review the bacteriology of the urine in renal tuberculosis and discuss the secondary infections in this disease. They have studied 63 cases in which the tubercle bacillus was found. They have a record of 30 cultures from the bladder with 15 positive results showing secondary infection. They have made 31 cultures from the right kidney with 7 positive results, and 28 cultures from the left kidney with 6 positive results. Smears of the urine from the bladder showed secondary infection in 21 cases. Smears from the urine from the kidney were made in practically all cases and were positive for secondary micro-organisms in only 5 instances.

Combining these results it is found that in 63 cases secondary infection was discovered 11 times on the non-tuberculous side and 7 times on the tuber-

culous side, making a total of 28 per cent of secondary infections found in association with tuberculous kidneys.

"The results show conclusively that while a negative smear or culture from the bladder in a case of cystitis and pyuria points strongly to tuberculosis, a positive smear or culture from the bladder, or even from the kidney urine, does not exclude this disease."

A. C. STOKES.

**Seres, M.: Pyelotomy in Nephrolithiasis** (La pielo-tomía en los cálculos del riñón). *Prog. de la clin.* Madrid, 1920, viii, 67.

On the basis of the literature amplified by statistics and cases observed by the author in his experience as Professor of Urology in the Faculty of Medicine in Seville, pyelotomy is regarded by Seres as the operation of choice in the treatment of renal calculi. It was formerly thought that this operation is more apt to be followed by fistula than incision of the kidney substance, but the contention has not been substantiated by the facts.

Among the advantages of pyelotomy over nephrotomy is the relative absence of hæmorrhage. In nephrotomy, even though the amount of blood lost at operation may not be great, the bleeding obscures the operative field so that the technique is rendered more difficult. In reaching the pelvis by way of the renal substance kidney tissue is disorganized; a zone of infarction and cicatrization and a consequent loss of renal parenchyma result, usually under conditions which demand that renal tissue be preserved. In order to lessen the zone of infarction some surgeons have advocated the use of silver wire as suture material. Others, however, claim there is no advantage in such a procedure. Usually also in nephrotomy the renal calyces are damaged in the search for stones, an injury which does not occur in pyelotomy.

Pyelotomy is the more simple procedure, it may be executed more rapidly, and it makes it possible to locate the stone more accurately. Statistics of operative results indicate in addition that the mortality of pyelotomy is lower.

The operative technique is divided into 7 stages:

1. Isolation and delivery of the kidney. The curved lumbar incision is used, the kidney freed from perinephric fat, the peritoneum carefully separated, and the kidney delivered with the fingers.

2. Isolation and exploration of the renal pelvis. By forward rotation the posterior surface of the renal pelvis may be brought into view and adhesions freed by means of gauze until the upper portion of the ureter is isolated. Complete denudation of the pelvis from the surrounding tissue is not advocated as a portion of the perinephric tissue is of value in making a complete closure of the pelvic incision. The calculus is located by digital palpation of the pelvis and its size and consistency are also determined in this way.

3. Incision of the pelvis longitudinally on the posterior surface above the calculus. The length

of the incision depends upon the size of the calculus. The pelvis is thus opened and the mobility of the calculus determined.

4. Extraction of the calculus. This is usually effected by finger enucleation although forceps and sounds may be employed. Care should be taken to prevent fragmentation of the calculus and tearing of the incision during the extraction. A special pair of forceps of the author's own invention lessens these dangers.

5. Exploration of the permeability of the ureters by means of a ureteral sound or ordinary bougie. In this exploration a hitherto unsuspected obstruction may be discovered. As a rule, however, obstruction may be determined beforehand by means of the X-ray.

6. Suture of the pelvis. Fine catgut is used, perinephric fat being included in the suture line to aid in obtaining more complete apposition and closure. Often this closure is re-enforced by a second line of sutures which include the regional perinephric tissues.

7. Drainage and closure. A rather long roll of gauze is applied to the posterior surface of the kidney and allowed to project outside of the wound. The kidney is replaced and the wound closed except for points of drainage.

As the fatty fibrous capsule of the posterior surface of the kidney is of special use in the suturing of the pelvic incision, its complete removal as practiced by some surgeons is not favored. Some surgeons do not suture at all, but Seres obtains complete closure with the establishment of the ureteral canal at once and thus often is able to abolish a source of infection. Payr's method of covering over the pyelotomy incision with a flap of renal capsule is regarded as unnecessary.

A good radiographic examination before operation is indispensable and the plates should be accessible during operation. The location, form, and number of the calculi are thus shown and extensive exploration at operation is rendered unnecessary. The shadow of the calculus may be:

1. Completely outside the renal shadow and in front of the hilus, which is the most convenient area for pyelotomy.

2. Partly outside the renal shadow and partly merged with it. In this case the renal pelvis is partly inside of the renal sinus but is still in a favorable position for pyelotomy.

3. Completely within the renal shadow. In this case the pelvis may be entirely inside the renal sinus.

W. R. MEEKER.

**Legueu, F.: New Ideas with Regard to Nephrectomy** (Les orientations nouvelles du problème de la néphrectomie). *J. d'urolog. méd. et chir.*, 1920, ix, 1.

Legueu states that ureteral catheterization, which was a distinct advance in urology, has become of less importance to renal surgery since the inauguration of other methods for testing the function of the kidney.



Chemical examination of the urine drawn from the two kidneys demonstrates which is the diseased side, but is of less value in determining the functional efficiency of the normal kidney. Since the correction and control of the results of catheterization by Ambard's constant Legueu has been surprised by the contradictory findings. Catheterizations which indicated good functional capacity have been disproved at operation and vice versa.

In one case catheterization showed a concentration of 25 gm. of urea to the liter associated with a polyuria of 175 gm. In view of the favorable findings the patient was operated on by another surgeon but died from renal insufficiency. This result, however, was expected by Legueu as the nitrogen content and Ambard's constant, tested before operation, showed irrefutably that the results of ureteral catheterization were of only relative value.

To determine the function of the kidney by an analysis of the urine a comparison of the results with Ambard's constant is necessary.

Legueu describes types of cases in which nephrectomy is indicated on the basis of Ambard's constant alone. For a number of years he has performed nephrectomy on the basis of the constant alone much more frequently than before, not only when catheterization was impossible but in many instances when, though possible, it appeared to be unnecessary.

Of 1,008 nephrectomies done up to the end of December 1919, the results of 13 are not yet known. Five hundred and fifty-eight done prior to December, 1915, are mentioned but not discussed. Of the remaining 437, 250 were based on the indications given by catheterization and 187 on those given by the constant alone. In the former the mortality was 3.2 per cent. and in the latter, 4.2 per cent.

When the constant is a figure less than 0.100 the disease is unilateral and nephrectomy can be done safely when it is known which side is diseased.

When the figure of the constant is above 0.120 the outlook is more serious. The higher the constant, the greater the danger, especially when it is above 0.140.

In cases of serious bilateral infection catheterization may be of value in determining which kidney is least involved. When a constant of 140, for instance, is associated with a decided inequality in the concentration of the urine from the two kidneys the latter is the factor indicating nephrectomy.

W. A. BRENNAN.

Chute, A. L.: *Secondary Nephrectomy*. *N. York M. J.*, 1920, cxi, 931.

The author defines secondary nephrectomy as the removal of a kidney at a varying period of time following a previous kidney operation which did not completely relieve the patient of his trouble. He divides cases of this kind into two classes, the first class being an elective class in which a primary palliative operation on the kidney was done as it was considered less dangerous than nephrectomy,

and the second class being made up of cases in which it was not the operator's intention to do a secondary nephrectomy, but he was obliged to do so either by chance or by an error in diagnosis or judgment.

The author analyzes 20 personal cases. Of these, 9 belonged to the first class. Seven of the 9 were cases of pyonephrosis in adults in which a two-stage removal of the kidney seemed as necessary as a two-stage operation in some prostatic cases. The two others were cases of hydronephrosis in children not operated on primarily by the author.

Eleven of the cases fell in the second class. Four were cases of nephrolithiasis with persistent urinary sinus; 1, a case of infarct; 1, a case in which a plastic operation for hydronephrosis was followed by poor drainage and infection; and 1, a case of hypernephroma in which a previous attempt at removal had been checked by severe hæmorrhage.

In the 20 cases there were 2 deaths. One fatal case was a case of hydronephrosis in the first class complicated by general tuberculosis, and the other, the case of hypernephroma in the second class.

The author discusses the operative complications in secondary nephrectomy, the value of an elliptical incision around the old scar, his method of preventing leakage from urinary sinuses during the operation, and the difficulty of separating adhesions, especially about the pedicle.

H. L. SANFORD.

Kolischer, G., and Eisenstaedt, J. S.: *Notes on Ureteral Stone*. *J. Michigan State M. Soc.*, 1920, xix, 189.

The original diagnosis of ureteral stone was symptomatic. Ureteral catheterization with the shadowgraph catheter and the X-ray have placed the diagnosis definitely on a firm basis.

If, when the ureteral orifice is so swollen that a catheter will not pass, pictures made with the bladder distended with oxygen show a shadow within the oxygen field, it is quite probable that the shadow is due to a stone within the bladder wall. If the orifice protrudes into the bladder transillumination with the cystoscope lamp in the fundus may show the shadow of a stone just above the orifice. If the ureteral mucosa is prolapsed into the bladder it is differentiated from a ureteral cyst by its increase in size when the urine is expelled and the emanation of the urinary whirl from its center.

Impacted ureteral stones in the upper third are best removed by way of the kidney pelvis. Ureterotomy is justly condemned. Impacted stones in the intravesical part of the ureter may be removed with the operating cystoscope. If that is impossible because of hæmorrhage or marked inflammation, suprapubic opening with direct exposure of the trigone is the method of choice. In the latter case the orifice is incised and the stone extracted with a pair of fine forceps. The incised orifice is not sewed up but oozing can be controlled with the galvanocautery. The suprapubic wound is closed without drainage.

C. D. PICKRELL.

**Kreissl, F., and Gehl, W. H.: Concerning Cystic Dilatation of the Vesical End of the Ureter, with Report of a Case.** *Illinois M. J.*, 1920, xxxvii, 315.

As the number of cases of cystic dilatation of the vesical end of the ureter which have been reported is small, the etiology of the condition is obscure. Stenosis of the ureteral orifice, either congenital or acquired, is considered by the authors as the most common cause. Rummell, Burkhardt, and Bustrom favor the theory of congenital origin because the ureter for a short distance is covered only by mucosa, or there may be a congenital weakness of the bladder muscle, and the orifice is devoid of the contractile muscle fibers of the bladder.

Clinically the results are the same. Difficult and frequent urination, terminal tenesmus, and back pressure with dilatation of the ureter and pelvis follow when the cyst has become large enough to cause disturbance.

In prolapse of the ureteral mucosa the blood vessels run to the base of the protrusion, while in a cyst they arise from the bladder mucosa. In prolapse there is a pedunculated base and a broader top which contain the ureteral orifice, while a ureterocele has a broad base with the ureteral orifice excentrically located. A prolapse may be replaced with a ureteral catheter. Following the emission of urine the ureterocele usually becomes collapsed but remains unchanged if the orifice is completely obstructed by oedema, pus, or a stone.

In a very small or early ureterocele cutting and cauterizing it through a cystoscope may be tried, but in cases of well-formed cysts of long duration operation is the method of choice. In the case cited the bladder was opened suprapubically, the orifice located, and a ureteral catheter introduced. The anterior and posterior walls were slit and the halves dissected free from the base. The ureteral mucosa was sutured to the bladder mucosa with fine catgut sutures. As infection of the pelvis was present the ureteral catheter leading out through the urethra was allowed to remain. Kidney function was improved. Because of the prolonged stenosis at the orifice, the ureter and pelvis were apparently dilated permanently.

C. D. PICKRELL.

#### BLADDER, URETHRA, AND PENIS

**Santi, E.: The Treatment of Acquired Incontinence of Urine in Women** (Contributo alla cura dell'incontinenza acquisita dell'urina nella donna). *Chir. d. organi di movimento*, 1919, iii, 247.

Santi reviews the various operative procedures used for the treatment of urinary incontinence in women and describes a method of his own.

Any operative method should be based on the following principles:

1. The urinary canal should be narrowed.
2. All tissue available should be utilized for the formation of valves which are important in effecting or increasing urinary continence.

3. The urinary canal should be lengthened as much as possible.

4. The urethra should be made to curve more than the normal urethra, and as far as possible the curvature should be made a double curvature.

Santi forms a new canal from the tissues of the anterior wall of the vulva and joins it to the primary urethra. He makes a semicircular incision on the lower half of the urethral opening so as to dissect from  $\frac{1}{2}$  to 1 cm. of the urethral tube from the vaginal wall. From each end of this incision he makes two other incisions transverse and equal in length to the curved incision. From the middle of each transverse incision he makes two perpendicular incisions which are parallel to the root of the clitoris and then diverge. These he prolongs to about half or the whole length of the clitoris. Beginning at the two vertical lines, two strips are freed from the center toward the exterior, their depth being made greater toward the exterior.

The external edges are approximated and sutured so as to form a tube for the prolongation of the urethra. Over this tube the two remaining edges of the perpendicular incisions are sutured together. The former opening is narrowed at the point of juncture, and a projection is formed by which urinary retention is facilitated. The clitoris also acts as a valve as it projects against the new canal. According to the extent of the vertical incisions the urinary canal will be lengthened by 3 or 4 cm. The curvature of the urethra is entirely changed and when the patient is in the horizontal position the urinary jet is almost vertical.

Santi describes three clinical cases in which he performed this operation with satisfactory results. The method is simple, may be utilized in all cases, and does not necessitate any important interference with the urinary system.

W. A. BRENNAN.

**Frassi, L.: Gunshot Wounds of the Bladder** (Osservazioni sulle ferite d'arma da fuoco della vesica). *Pollicin.*, Roma, 1920, xxvii, 70, 84.

In his own experience in an Italian Military Hospital and an exhaustive study of the literature, Frassi found that gunshot wounds of the bladder are relatively rare.

Clinically, bladder lesions are distinguished as intra- and extraperitoneal lesions. Isolated bladder lesions are very rare and in such cases the projectile may or may not be retained. When bladder injuries are associated with lesions of the neighboring organs they are usually intra- rather than extraperitoneal.

The bladder is generally injured by the penetration of a projectile through the perineal, ischiatic, or sacral route, more rarely by the anterior route. The gravity of a bladder wound depends upon the traumatizing agent and the rapidity with which infection develops. Osseous complications are the most frequent. Among others are lesions of the intestinal loops, the extraperitoneal portion of the rectum, the urethra, limbs, vessels, and nerves.



Except in cases of small bladder wounds without symptoms of complications and those in which the circumstances of time and place hinder operation, the treatment of extraperitoneal bladder injuries is usually surgical.

In cases of intraperitoneal wounds of the bladder a laparotomy should always be done to discover the associated injuries, to repair perforations in the intestine, etc., prevent hæmorrhage, check the flow of urine into the peritoneal cavity, and effect drainage.

When during expectant treatment with the use of a retention catheter and opening up of the track of the wound there is dangerous suppurative operation should be done immediately.

Suprapubic cystotomy is the operation of choice in extraperitoneal lesions whenever the presence of grave lesions in the inferior quadrants is suspected, the projectile is retained, rectal symptoms develop, or there is persistent hæmorrhage. The operation is indicated secondarily when the catheter has been found insufficient. In addition to its diagnostic and curative value this operation is of advantage in that it usually prevents complications.

When there are simultaneous extraperitoneal lesions of the rectum and bladder a suprapubic cystotomy supplemented by other suitable operations (incision of the sphincter, the formation of an iliac anus, etc.) prevents retention of fæces and pollution of the wound track and bladder.

Because of the danger of infection fractures of the pelvic bones, which are common complications of bladder wounds, may be followed by a severe osteomyelitis. Such foci of suppuration, when not opportunely treated, lead to the formation of fistulæ opening externally or toward the bladder. When they open toward the bladder a severe and rebellious cystitis and the formation of calculi usually result. The latter may be expelled spontaneously or may require operative removal.

Phlegmons due to bladder lesions, commonly localized in the prevesical and retrovesical space, often invade the perivesical space and infiltrate the subperitoneal space. To prevent such suppurations and keep the pus from reaching the peritoneal cavity ample drainage should be established as early as possible by the perineal route and lateral incisions should be made in the lower quadrants of the abdomen parallel to the recti muscles.

Bladder wounds running a complicated course and in which the projectile is retained or calculi are formed should be subjected to periodical radiographic and cystoscopic examinations in order that the passage of other metallic or bony particles into the bladder may be prevented and the formation of fistulæ opening into the bladder discovered.

Wounds with retention of projectiles in the perivesical space should be kept under observation for a long period and if pain or other vesical symptoms arise the possibility of the entrance of the projectile into the bladder should be taken into consideration.

W. A. BRENNAN.

## GENITAL ORGANS

**Marion, G.: The Significance of the Chronic Vesiculitis of Prostatic Conditions** (De la signification des vésiculites chroniques chez les prostatiques). *J. d'urolog. méd. et chir.*, 1920, ix, 11.

Marion gives the clinical histories of three patients with symptoms of dysuria of prostatic origin and vesiculitis. The prostatic lesion in every instance was a neoplasm.

It was formerly believed that a prostatic neoplasm is a bilateral prolongation characterized by neoplastic induration of the vesicular regions, the latter being an extension of the neoplastic process in the prostate. If this assumption is true, operation is contra-indicated, but if the vesicular condition is simply a retrograde dilatation of the seminal vesicles, the neoplastic prostate may be removed.

The presence of vesicles which are augmented in volume is of very great diagnostic significance. If these are found in a patient showing distinct symptoms of prostatism, it suggests prostatic cancer. A similar vesiculitis occurs in chronic prostatitis, but in such cases the syndrome of prostatism is absent.

In the three cases of chronic vesiculitis reported in this article the vesicular lesions could not be attributed to the prostatic condition as the neoplasm was still limited to the prostate. Marion therefore concludes that a unilateral or bilateral vesicular induration indicates the presence of a neoplasm in the prostate, but is not a prolongation of the neoplasm and, at least in certain cases, does not contra-indicate operation. The removal should be similar to that of a hypertrophied prostate by the suprapubic route.

As a rule prostatic cancers recur in from six months to two years. In the author's cases the operation has been supplemented by the application of radium but was done too recently to warrant conclusions as to the end-results.

The removal of the seminal vesicles does not affect the prognosis of the prostatectomy.

W. A. BRENNAN.

**Player, L. P., and Mathé, C. E.: Clinical Observation and Treatment of 134 Cases of Chronic Prostatitis.** *California State J. M.*, 1910, xviii, 152.

The conclusions based on the study of 134 cases of chronic prostatitis are as follows:

1. In the treatment of chronic prostatitis a careful history must be taken, a thorough examination made, and the patient placed under one of a number of routine methods of treatment intended to meet the pathologic condition present and others that may arise.

2. When the patient has had gonorrhœa, two or more massages are necessary before a negative report can be given. In many cases in which a normal secretion is obtained on the first massage a pathologic condition is indicated by that of the second or third massage.



3. When, in the cases studied, the prostatitis was associated with tabes, the routine treatment, consisting of massage, instrumentation, and instillations, gave little, if any, benefit, and in some instances was positively harmful.

4. The form of treatment should be based upon the amount of the involvement of the prostate.

5. Prostatitis complicated by seminal vesiculitis and arthritis is benefited most by massage, systematic stripping of the vesicles, dilatation of the posterior urethra, deep instillations, splinting of the affected joints, and the use of stock vaccines. Extreme cases are treated best by dilatation of the stenosed ejaculatory ducts, vasotomy, or the radical seminal vesiculotomy.

6. In the series of 134 cases 12 showed no improvement; 26, slight improvement; 47, great improvement; and 48, marked improvement with probable cure.

7. On the whole, all cases are very resistant to treatment, but the longer intelligent treatment is continued, the better the results.

8. The most resistant cases will be benefited if a sufficient number of proper treatments are given and all complications are looked for and overcome. Lesions of the posterior urethra are not seen as well with the ordinary endoscope as with the cystourethroscope of Buerger and McCarthy.

9. In the average case treatments given at five-day intervals.

LOUIS GROSS.

**Hayes, D. J.: Some Points on Prostatectomy with Special Reference to Its After-Treatment.**  
*Illinois M. J.*, 1920, xxxvii, 325.

The author places great emphasis upon the importance of early removal of the prostate before back pressure has irreparably damaged the kidneys and bladder. He divides cases into four classes as regards the pre-operative treatment. When there is a large amount of residual urine it should be withdrawn gradually over a period of several days so that later back-pressure reaction will be prevented. In the second class of cases, in which there is severe cystitis and a large amount of pus, a retained catheter with frequent irrigations should be used. In the third class marked distortion of the prostatic urethra renders catheterization difficult and painful and therefore suprapubic drainage is advised. The fourth class of cases are those of patients who cannot stand an operation. Suprapubic drainage should be established with a catheter introduced through a trocar. When there are cardiovascular changes, a high blood pressure, etc., an internist should be consulted.

The author advocates the suprapubic operation under local anaesthesia. When the bladder is reached, gas and oxygen should be used. Profuse hæmorrhage is controlled with a continuous lock suture along the margin of the lacerated mucous membrane, and continued hæmorrhage stopped by packing the prostatic cavity. The author has obtained the best results without the postoperative drainage tube and the retained catheter.

C. D. PICKRELL.

**Walker, J. W. T.: Hæmorrhage and Postoperative Obstruction in Suprapubic Prostatectomy: Open Operation for Their Prevention.** *Brit. J. Surg.*, 1920, vii, 525.

Hæmorrhage may be troublesome during suprapubic prostatectomy and may complicate the after-treatment. When there is bleeding during enucleation, however, there is usually no trouble later. Before operation it is impossible to foretell which cases will be troublesome, but a high blood pressure suggests the risk of hæmorrhage. A large, sacculent prostate is more apt to bleed than a small prostate. After long-continued vesical manipulation with resulting infection the prostate generally bleeds only slightly during or after the operation. Late hæmorrhage, which is due as a rule to sepsis, may be brought on by exertion, rough catheterization, or the use of large enemata.

Massage of the prostatic cavity followed by irrigation with a hot, weak solution of silver nitrate will prevent hæmorrhage or at least aid in arresting it. The author installs constant irrigation with a mildly astringent solution for all late hæmorrhages. If this fails, gauze is packed around a urethral catheter until the prostatic cavity is tightly filled, the foot of the bed is raised, and a hypodermic of morphia is given. Two or three days later the packing is withdrawn after being loosened by irrigation through the partially removed catheter.

Patients with atony of the bladder are unsuitable for operation whether their condition is due to diseases of the central nervous system or not. The residual urine in a tabetic bladder may simulate that caused by an enlarged prostate. The patient's youth, the lack of demonstrable hypertrophy, and the typical trabeculated bladder should suggest the need of a neurological examination. Prostatic hypertrophy and a tabetic bladder may be present in the same person. The cystitis in a tabetic bladder is often painful, while the bladder subject to prostatic obstruction generally gives no discomfort. The trabeculation resulting from diseases of the spinal cord is much finer than the thick fleshy type resulting from prostatic obstruction. An operation should not be performed if there is no other evidence of disease than an atonic bladder which resembles that caused by diseases of the nervous system.

Stricture following prostatectomy may develop at the membranous urethra and at the outlet of the bladder where the mucosa has been torn across after enucleation. The bladder wall may form a canopy over the prostatic cavity. The opening, which at times is quite small, may completely close over, separating the bladder from the urethral opening. This condition is indicated by the increased drainage from the suprapubic sinus and the difficulty encountered in urethral catheterization. A strip of mucous membrane or a nodule of prostatic tissue may cause intermittent obstruction by plugging the urethral outlet.

The author describes the operation in detail. The bladder and prostatic cavity are fully exposed



through a wide incision. The patient is placed in the Trendelenburg position after the enucleation, and stay sutures are put in each lip of the bladder wound. Bladder retractors are inserted and the field of operation is inspected. Arterial bleeding, which often comes from an artery situated in the posterior free edge of the bladder mucosa, may be controlled by a stitch ligature. Venous bleeding is checked by gauze packing. In one case the author pushed the wall of the bladder away from the symphysis pubis and ligated the main branch of the prostatic plexus to control extensive venous oozing.

Strips of mucous membrane and nodules of prostatic tissue are removed and the posterior fold is incised in order to prevent narrowing of the vesicoprostatic opening.

Free drainage is employed and the bladder closed by interrupted catgut sutures. A. J. SCHOLL, JR.

**Dillon, J. R., and Blaisdell, F. E.: The Surgical Pathology of the Seminal Vesicles.** *California State J. M.*, 1920, xviii, 149.

In the prophylaxis and treatment of the seminal vesicles it is highly important to have in mind the structural changes which may involve them during the various stages of an urethritis.

In studying the pathology of sections obtained from different cases at operation and comparing them with the clinical manifestations before and after operation the authors found that simple drainage is not always sufficient to accomplish the purpose of the operation and may account for many of the unsatisfactory results of vesiculotomy.

There are two distinct pathologic changes: first, those involving the intrinsic structures, and second, those involving the extrinsic processes. The authors classify the conditions into the following four types: (1) those in which neither the intrinsic nor the extrinsic changes are macroscopically evident; (2) those in which only the extrinsic changes are macroscopically evident; (3) those in which only the intrinsic changes are macroscopically evident; and (4) those in which both the intrinsic and extrinsic changes are macroscopically evident.

In Types 1 and 2 the results of vesiculotomy were uniformly good in the cases studied. In Type 3 the condition was greatly benefited when the vesicles were excised and only slightly improved, if improved at all, when they were drained. In Type 4 the results of drainage were uniformly poor. Patients who claim that their rheumatism is always relieved for a day or two following intercourse are affected with a condition belonging to Types 1 or 2. Some patients state that ejaculations during intercourse produce a diminished amount of semen and it is in these cases that the authors find gonorrhœal rheumatism, impotence, and neurasthenia most resistant to treatment. In such instances the best results are obtained by draining or removing the vesicles.

As yet the authors have no data as to the effect of vesiculotomy and vesiculectomy on sterility. They have found, however, that they do not exert an ill effect on the sexual capacity and in many cases are followed by improvement. LOUIS GROSS.

# SURGERY OF THE EYE AND EAR

## EYE

**Clapp, C. A.: The Removal of Steel from the Eye from an Industrial Standpoint.** *Am. J. Ophth.*, 1920, iii, 325.

The author reports a series of 29 cases in 10 (35 per cent) of which useful vision was obtained after magnet extraction of the foreign body. In 11 cases (38 per cent) the eye was lost, in 7 (24 per cent) light perception to motion was retained, and in 4 cases normal vision resulted. Of the 7 patients operated on by the posterior route 5 retained useful vision. In 16 cases the injury occurred in the right eye, and in 12 in the left. The average size of the foreign body was 4.8 by 2 by 1 mm.; the largest was 20 by 5 by 4 mm.; the smallest, 1 by 0.5 by 0.5 mm.

The author states that until a few years ago his experience had led him to favor the anterior method of extraction but he now prefers the posterior route. It must be borne in mind, however, that each case should be handled according to its particular requirements.

W. F. MONCREIFF.

**Skyes, E. M.: The Effect of Certain Intranasal Conditions upon the Extrinsic Muscles of the Eye.** *Texas State J. M.*, 1920, xvi, 10.

The author lays emphasis upon the importance of chronic sinusitis and narrowing or blocking of the frontal sinus ostium, which cause vacuum headaches as etiological factors in asthenopia which fails to respond satisfactorily to the correction of refractive errors and treatment of muscle imbalance. He quotes statistics showing that from 7 to 10 per cent of patients seeking relief from headaches at the hands of the ophthalmologist have accessory sinus disease which is the direct cause of the headache. He reports 4 cases in which various eye symptoms, particularly headache and inability to use the eyes for near work, were relieved only after adequate drainage of infected sinuses.

W. F. MONCREIFF.

**Jackson, E.: The Capsule in Cataract Extraction.** *Arch. Ophth.*, 1920, xlix, 275.

Jackson emphasizes the importance of taking into consideration the fundamental anatomy, physiology, and pathologic possibilities of the capsule. He reviews the physics as well as the anatomy and physiology and draws the conclusion that the capsule itself is wholly passive, it does not become opaque, and it does not of itself thicken. He believes also that the epithelium lining the anterior capsule is not a source of danger to vision in senile eyes.

The secondary cataract appearing after lens extraction is composed of tissue developed from fibroblasts which attach themselves to the capsule

at the time of the irritation or inflammation immediately following the extraction. As a rule such irritation is not seen when the lens is extracted in the capsule and when the capsule is divided peripherally rather than by the usual capsulotomy. Therefore it seems probable that the irritation resulting in secondary cataract is due to lens matter in the anterior chamber which excites a reaction on the part of the iris.

T. D. ALLEN.

**Weeks, J. E.: The Operative Treatment of Glaucoma.** *Arch. Ophth.*, 1920, xlix, 316.

Weeks insists on the necessity for differentiating between various forms of glaucoma and for adapting the operative procedure to the form. Because of the absence of lymph spaces at the filtration angle in congenital glaucoma he considers a filtration cicatrix essential. He prefers the use of the trephine to the La Grange operation, and states that if the iris presents, a liberal portion should be excised.

Juvenile glaucoma is discussed as well as the senile types. These the author divides into the congestive and the non-congestive or simple chronic types.

In cases of acute or congestive glaucoma, after an attempt for a day or so to relieve the condition by medication, Weeks does the classical iridectomy because, by the removal of a portion of the iris, the filtration angle is opened up, the iris is pulled away from the angle on the opposite side by traction, and the cut surfaces of the iris afford an exit for the aqueous humour.

Weeks does the same operation for the earlier stage of non-congestive glaucoma before the iris has become adherent at the iris angle and before the sclerosing process has obliterated the lymph spaces. In the presence of such pathologic conditions he prefers to establish a filtering cicatrix. In some cases it is quite difficult to decide upon the type of operation but the author would rather err in choosing a filtering cicatrix earlier than is necessary rather than later. He describes several methods of producing such results and reviews their statistics. He inclines toward the La Grange operation and the trephine of Elliot. He prefers the former on account of the intra-ocular hemorrhages, iritis, detachment of the choroid, return of tension from blocking of the opening, and late infection which may occur in the Elliot operation. The latter he considers only in cases of buphthalmos, certain cases of deep anterior chamber, and cases of chronic simple glaucoma with low hypertension.

In performing the La Grange operation, Weeks makes the incision 5 mm. long rather than 7 mm. in order to avoid the danger of prolapse of the ciliary body, lens, or vitreous. The after-treatment in-



cludes daily massage beginning forty-eight hours after the operation, when the tension is not subnormal, to assist in the formation of a filtering cicatrix.

In secondary glaucoma with iritis the hypertension usually subsides spontaneously, but in some cases a paracentesis may be necessary. In other cases of secondary glaucoma Weeks sometimes does a trephination and sometimes an iridectomy.

T. D. ALLEN.

## EAR

**Gray, A. A.: On Some Anatomical Features of the Vestibule Not Previously Recorded.** *Proc. Roy. Soc. Med., Lond.*, 1920, xiii, Sect. Otol., 17.

Gray draws attention to the fact that the footplate of the stapes and the adjacent tissue in the immediate vicinity of the oval window are not composed entirely of bony tissue in the ordinary sense, but contain a mixture of bone and cartilage. While the cartilaginous element in the footplate of the stapes has long been recognized, Gray does not believe there has ever been a description of the cartilaginous element in the adjacent walls of the vestibule.

In the portion lying above and below the footplate the band has a diameter equal to about one-third of that of the footplate itself in its small diameter but at the anterior and posterior regions the band is usually considerably broader. It is narrowest opposite the posterior third of the lower margin of the oval window and next narrowest at a corresponding point near the upper margin of the oval window. Thus it is narrow at points opposite one another on the two horizontal walls of the oval window, near the juncture of these middle and posterior thirds.

As regards the general significance of this cartilaginous element, Gray is of the opinion that it is doubtless a remnant of the original foetal cartilaginous capsule of the labyrinth in which the bony capsule develops later on.

Another detail is the deep cleft which passes forward and downward from the anterior margin of the oval window, and still another, the small foramen found in the outer wall of the vestibule immediately behind the posterior margin of the oval window.

In the cadaveric position of the footplate of the stapes the posterior third of the footplate is rotated inward and the anterior two-thirds outward. From this evidence it appears probable that either at the moment of death, or else during rigor mortis, the stapedius muscle undergoes contraction and causes a rotation of the stapes round a vertical axis which passes through the footplate at the juncture of the middle and posterior thirds. According to the evidence, therefore, the function of the stapedius muscle in man is to draw the anterior two-thirds of the bone outward from the vestibule and at the same time to drive the posterior third inward.

Inasmuch as the layer of cartilage is no more abundant in front of the oval window (where the otosclerotic process usually begins) than behind it, Gray does not believe the presence of cartilage in the wall of the vestibule surrounding the footplate of the stapes has any bearing on the pathogenesis of otosclerosis.

O. M. ROTT.

**Marks, H. J.: Labyrinthine Complications in Middle Ear Suppurations.** *Med. J. Australia*, 1920, i, 429.

The author recognizes and describes four types of labyrinthitis: (1) diffuse purulent manifest labyrinthitis; subacute labyrinthitis; (2) diffuse purulent latent; (3) circumscribed; and (4) diffuse serous induced and secondary.

In considering the indications for operation the following factors should be taken into consideration: (1) the syndrome causing the labyrinthine trouble; (2) the character of the disease; (3) the direct or indirect anatomical findings on the inner tympanic wall before, and in the area involved during, the mastoid operation; and (4) the tendency toward intracranial extension or the presence of signs of an intracranial complication.

Clinical notes of six cases are given: Case 1, sudden labyrinthine destruction after the removal of an aural polypus; Case 2, diffuse induced labyrinthitis supervening on acute suppurative mastoiditis and the presence of pus around the lateral sinus in chronic middle-ear suppuration with cholesteatoma; Case 3, circumscribed labyrinthitis with a fistula in the horizontal canal; Case 4, attic suppuration and cholesteatoma with symptoms of fistula; Case 5, circumscribed labyrinthitis with a polypus in the region of the foramen ovale; acute diffuse suppurative labyrinthitis supervening three days after a radical mastoid operation; spontaneous rupture of the pus through the foramen ovale; and Case 6, rupture of the the labyrinthine capsule by the removal of a polypus in old chronic purulent otitis media; acute diffuse, serous, and purulent labyrinthitis supervening on the eighteenth day after a radical mastoid operation.

O. M. ROTT.

**Fraser, J. S., and Dickie, J. K. M.: Meningitic Neurolabyrinthitis.** *Proc. Roy. Soc. Med., Lond.*, 1920, xiii, Sect. Otol., 23.

Meningitic neurolabyrinthitis is a frequent cause of deafness and deaf-mutism.

Deafness caused by epidemic cerebrospinal meningitis is certainly due to meningitic neurolabyrinthitis.

Measles and pneumonia may be followed by meningitis and secondary neurolabyrinthitis. In acquired syphilis and in mumps leptomeningitis is of common occurrence and associated with inner ear deafness which is probably due to neuritis or neurolabyrinthitis. No microscopic examination, however, has been made as yet. Certain cases of deafness following influenza and osteomyelitis also may be of meningitic origin.

The original source of infection may be in the respiratory tract, the parotid gland, the genital organs, the long bones, or elsewhere.

In all cases a blood infection (septicæmia) is probably the connecting link between the primary disease and the onset of meningitis.

Meningitic neurolabyrinthitis is usually, but by no means always, bilateral. The onset is generally sudden. Irritative symptoms such as tinnitus and giddiness are often present, but may not be observed because of the patient's mental condition (coma). In epidemic cerebrospinal meningitis and parotitis deafness usually occurs early in the course of the disease.

Deafness due to meningitic neurolabyrinthitis may be associated with other metastatic lesions, e. g., orchitis, arthritis, mastitis, blindness, or paralysis of the oculomotor nerves.

The infection usually passes along the subarachnoid space from the base into the internal auditory meatus and then along the nerves and vessels to the labyrinth. In some cases the perilymphatic aqueduct is the route of invasion, while in others both paths may be involved.

As a rule both the cochlear and vestibular apparatus are affected. In many cases the cochlear apparatus is involved mainly or alone. A more or less isolated affection of the vestibular apparatus is very rare.

The pathologic changes producing the deafness may be: (1) hydrocephalus; (2) changes in the walls of the fourth ventricle; (3) purulent infiltration of the eighth nerve with subsequent descending neuritis associated with atrophy of the spiral ganglion cells and Corti's organ; (4) purulent labyrinthitis which, if the patient lives long enough, is followed by the formation of granulation tissue and later by the formation of new connective tissue and bone in the hollow spaces of the labyrinth.

The resulting deafness in the ear (or ears) affected is usually complete and permanent.

Vestibular symptoms (loss of balance and a waddling gait) pass off rapidly in adults, but in young children may persist as long as one year.

In cases of sudden nerve deafness with or without vestibular symptoms, lumbar puncture should be done and the cerebrospinal fluid examined chemically and microscopically. The Wassermann reaction of the fluid should also be tested and cultures made.

Repeated lumbar punctures are of value in the treatment, especially in cases of deafness due to hydrocephalus. Small doses of potassium iodide and hypodermic injections of pilocarpin have been used in cases of meningitic neurolabyrinthitis, but apparently without success.

O. M. ROTT.

**Portmann, G.: Mastoiditis and Suboccipital Pott's Disease** (Mastoidite et mal de Pott sous-occipital). *Rev. de chir.*, Par., 1919, vii, 916.

Portmann directs attention to the importance of a clear differential diagnosis between mastoiditis and suboccipital Pott's disease in adults. Pott's disease is amenable to medical treatment while supuration of the mastoid requires surgical treatment.

The findings in Pott's disease and mastoiditis in each of their three stages are summarized as follows:

#### SUBOCCIPITAL POTT'S DISEASE

#### MASTOIDITIS

##### *When There Is No Cervical Abscess*

Spontaneous and provoked nuchal pains which are exaggerated by movement of the head.

No morphological change in the mastoid region. Early and marked stiffness of the neck.

No auricular symptoms. Poor general condition and often coexisting bacillary lesions in other organs.

Spontaneous pains in the mastoid region and pain provoked by pressure about the antrum and apex.

Morphological change in the mastoid region.

No stiffness or only slight stiffness of the neck.

Auricular symptoms.

##### *When There Is Cervical Abscess*

Slight spontaneous or provoked pain in the region of the abscess.

Very regular, not phlegmasitic abscess without peripheral oedema.

Serous grumous pus from which a cytological and bacteriological diagnosis can be made.

Very marked spontaneous or provoked pain in the abscess region radiating throughout the head on that side.

Poorly outlined abscess with peripheral infiltration and inflammatory reaction. Exudation of pus on pressure.

Phlegmonous thick pus which the laboratory examination demonstrated is non-tuberculous.

##### *When There Is Fistulization*

Fistula with irregular violet edges and sometimes fungosities and thin pus.

Radiographically demonstrated lesions of the upper cervical vertebrae.

A sound introduced into the fistula tends to enter in the direction of the cervical vertebrae.

Fistula with regular red edges and a phlegmonous pus exudate.

No lesions of the cervical vertebrae.

A sound introduced into the fistula tends to enter in the direction of the mastoid.

Several clinical cases are described in which suboccipital Pott's disease was diagnosed and treated as mastoiditis.

W. A. BRENNAN.



# SURGERY OF THE NOSE, THROAT, AND MOUTH

## NOSE

**Oppenheimer, S.: The Surgical Correction of the Aquiline or Hump Nose.** *Am. J. Surg.*, 1920  
xxxiv, 121.

In the operative procedure described the tip of the nose is elevated and by means of a small scalpel a short semicircular incision is made in the antero-lateral portion of the nasal vestibule, just below the point of juncture between the lateral cartilages and the nasal bone. Through this incision small blunt-pointed scissors or blunt dissectors of the Freer type are introduced between the nasal bone and the overlying integument and the skin over the dorsum of the nose is thoroughly undermined. The extent of the undermining is determined largely by the size of the hump to be removed. Care is taken to avoid puncturing the skin. When the hump is of moderate size the undermining may be accomplished satisfactorily through an incision in one vestibule, usually the left, but if necessary a similar intranasal incision may be made also through the other vestibule.

The hump is removed with a small saw, scissors, or rasp introduced through the incision. Usually the rasp is found very satisfactory. With a forward and downward motion paralleling the nasal ridge the anterior borders of the nasal bones are trimmed down until the hump is obliterated to a sufficient degree. When the base from which the hump is removed appears to be very broad and sharp, the edges are rasped off or shaved down with a small chisel. Oozing is controlled by local applications of thromboplastin on cotton. Rubber tissue drainage strips are inserted through the primary intranasal incisions and carried well up on the dorsum of the nose. These strips are allowed to remain *in situ* for three or four days or longer if deemed desirable. The nostrils are lightly packed with petrolatum gauze or bismuth petrolatum gauze. Local inflammatory reaction is checked by the prompt application of iced compresses locally, but in many cases it is remarkable how little local reaction is aroused. A splint of dental compound molded to fit the patient's nose and held in place by adhesive strips affords excellent protection against injury.

The following day the nasal packing is removed and the nose cleansed of clot and secretion with a warm nasal douche. Inhalation of medicated steam vapor is of value in the reduction of the swollen tissues. Under this treatment the nasal structures return to a very normal appearance in a fairly short time, but the patient is warned that it may be several months before all trace of inflammatory reaction and thickening of the tissues disappears and

the full cosmetic benefit of the operation is obtained. Photographs or plaster casts made before and after the operation are important in all cases.

When the hump is so exaggerated that virtually the entire nose from the frontal notch to the tip is oversized a more extensive undermining of the skin is necessary than when the operation is done merely to remove a hump. In such cases the undermining extends from the frontal eminence to the nasal tip and over the nasal processes of the superior maxilla where the nasal base is also to be narrowed.

In the reduction of the height of the nose the operative area is undermined, the nasal bones are sawed through from above, at the frontal notch, downward, and the required amount of bony dorsum is removed. The cartilaginous portion is then trimmed with the scalpel in a similar manner and the detached tissue is removed through the intra-nasal incision. When in this procedure an opening is made into the nasal chambers no ill effects appear to ensue, but some authorities caution against it.

After the reduction of the height of the dorsum of nose the length and width may appear increased and the lobule is brought into greater prominence than before. If it appears desirable to reduce the width of the nasal base, this is accomplished by sawing through the two nasal processes at their juncture with the superior maxilla, the periosteum being first separated with an elevator. The lower edges are then made to approach the midline of the nose by pressure of the thumb and index finger, and the nasal bones are fractured at the nasofrontal juncture. When necessary to bring about a sufficient degree of mobility of the nasal processes and nasal bones, they are seized with forceps such as the Adam's forceps, one blade being inserted through the incision and the other into the nasal vestibule.

When the lessened height of the dorsum makes the top of the nose seem broader and flatter than is desired, the condition is remedied by slanting the superior edges of the nasal bones inward toward the median line.

In case the whole nose is too long, it is shortened by resecting a triangular piece of the cartilaginous septum which is taken horizontally from its inferior border with the inclusion of a part of the membranous septum beneath it. The base of this triangular septal resection, which is from 3 to 5 mm. wide, is placed anteriorly just beneath the nasal tip and the apex is placed at the inferior nasal spine. The septal incision is made with a straight scalpel. After the triangular piece of septum including the mucosa on both sides is removed, the tip and columns are attached by suture to the freshly formed inferior margin of the triangular cartilage. This elevates the nasal tip and makes the septum shorter. If it is

necessary, the lateral walls of the nose are narrowed by the removal from the inside of each nostril—in a horizontal direction and a little above the lower lateral cartilage—of a triangular strip including both mucous membrane and cartilage. The size of this strip determines the degree to which the lateral walls are made narrower. The wounds formed in this last step are closed with several silk sutures.

O. M. ROTT.

**Tieck, G. J. E.: New Intranasal Procedures for the Correction of Deformities of the Nose Successfully Applied in Over 1,000 Cases during the Past Twelve Years.** *Am. J. Surg.*, 1920, xxxiv, 117.

Intranasal procedures for the correction of nasal deformities are divided into two stages: (1) the exposure, and (2) the actual correction or reconstruction.

The author's method of obtaining exposure is practically the same in all cases. As a rule four intranasal incisions in each nasal fossa are necessary to separate the skin and periosteum from the bone. Occasionally, however, two or three may be sufficient.

The first incision is made along the border of the pyriform opening of the nose. Beginning at the lower end of the nasal bone, it is carried downward and outward, through the mucous membrane and chondro-osseous juncture. An elevator is then passed through this incision, insinuated between the periosteum overlying the nasal and maxillary bones, and swept laterally and mesially, lifting from the bone the periosteum, subcutaneous tissue, and skin. The entire area extending from the root of the nose laterally over the nasal bones and superior maxilla is liberated in this way.

The second incision is made parallel to the bridge of the nose. Beginning at the lower end of the nasal bone, it is carried downward and forward along the anterior edge of the bony and cartilaginous septum to the tip of the nose and is made through the cartilage up to the perichondrium overlying the bridge of the nose. Then, by careful dissection, the perichondrium and soft tissues over the bridge of the nose and the lateral cartilages are separated from the underlying bony and cartilaginous septum and lateral cartilages. At this stage it should be possible to sweep the elevator freely over the bridge of the nose, from the roots to the tip and laterally well out over the cheeks, in the artificial space created between the periosteum and cartilage. It is absolutely essential that this area be entirely freed in all operations in order that the shrinkage will be uniform without the formation of the wrinkles or dimples which would result if at any point the overlying tissues remained in contact with the bone.

The third incision is made through the mucous membrane and cartilage from one nostril to the other. Beginning at the end of the second incision (the tip of the nose), it is carried backward along the lower border of the quadrilateral cartilage to the nasal crest of the superior maxillary bone.

The fourth incision is made through the lower lateral cartilage at the point where the cartilage bends upon itself. It divides the lower lateral cartilage into an external and internal half.

The last two incisions described are necessary to obtain the exposure essential for plastic work on the septum and cartilage.

The author briefly outlines the methods used in the correction of various deformities. While each case presents its own problems, any deformity may be corrected through the incisions described.

O. M. ROTT.

**White, L. E.: The Diagnosis and Prognosis of Loss of Vision from Accessory Sinus Disease.** *J. Am. M. Ass.*, 1920, lxxiv, 1510.

There are various types of accessory sinus blindness. Some of them become cured spontaneously, while others result in permanent loss of vision unless given prompt and proper attention. Etiologically they are generally divided as follows: (1) those due to the direct spread of the infection to the sheath of the optic nerve; (2) those due to the toxæmia from infection in the sinuses; and (3) those due to hyperplasia.

Usually the first two types may be diagnosed easily either by inspection or from the roentgenograms, although pus, which was not detected previously, is occasionally found at operation. When in doubtful cases all other causes of the blindness have been eliminated, it is advisable to operate on the sinuses.

Two factors enter largely into the prognosis: (1) the length of time before the patient seeks relief, and (2) the degree of the blindness.

Unless the condition shows improvement under treatment before the end of a week there is danger of permanent loss of vision unless the pressure on the nerve is relieved. In cases of more than two months' duration little can be expected.

When the loss of vision is total the demand for operation is more imperative than when it is only partial.

O. M. ROTT.

**New, G. B.: The Treatment of Malignant Tumors of the Antrum.** *J. Am. M. Ass.*, 1920, lxxiv, 1296.

The author treats malignant tumors of the antrum by cauterization followed by radium instead of by the older method of resecting the upper jaw. During the past two and one-half years, 33 malignant tumors of the antrum have been examined at the Mayo Clinic. Since 18 of the 33 patients were treated, it can not be called a selected group of cases (see table).

The group of tumors operated on included 8 squamous-cell epitheliomata, 6 sarcomata, 1 malignant tumor (type of cell not determined), 1 epithelioma (mixed-tumor type), 1 basal-cell epithelioma, and 1 fibromyxoma (malignant).

In the selection of cases to be treated the type of malignancy as well as the extent of the tumor must be considered. The patient's age and the length of



## RESULTS IN 18 CASES OF MALIGNANT TUMORS OF THE ANTRUM TREATED BY CAUTERY AND RADIUM

Number	Age	Sex	Duration of Lesion Before Operation	Pathologic Diagnosis	Length of Time Since Last Operation Months	Present Condition; Result
1	65024	62	m	6 months	7	Dead
2	109408	38	f	Recurring; first operation in 1914	15	No recurrence
3	207005	28	m	2 years	26	Data not obtainable
4	207386	56	m	6 months	27	Hopeless recurrence
5	207662	62	m	10 months	27	Data not obtainable
6	208383	58	f	16 months	27	Data not obtainable
7	210487	19	m	3 years	28	No recurrence
8	229112	38	m	1 year	22	No recurrence
9	231539	39	f	15 months	12	Dead
10	235481	17	m	3 years	8	No recurrence
11	235903	47	m	3 years	20	Recurrence
12	238077	47	m	3 months	12	Dead
13	239838	63	f	2½ months	19	No recurrence
14	244630	39	m	5 months	13	No recurrence
15	245402	57	m	6 months	17	No recurrence
16	250256	15	m	5 months	15	No recurrence
17	262797	35	m	16 months	8	No recurrence
18	272557	12	f	?	9	No recurrence

the history also are important factors. Involvement of the nose, the floor of the orbit, and the sinuses renders the prognosis grave, but does not exclude the possibility of help from treatment. No patients with glandular involvement were selected for treatment.

The usual treatment of malignant disease of the antrum by resection of the jaw has not given a high percentage of cures because of the difficulty of entirely removing the tumor. This form of treatment also is associated with an operative mortality.

In the operation performed by the author the patient is anesthetized with ether by the drop method. After anesthesia has been induced the mask is removed and the head of the table is lowered to prevent the drainage of secretion from the pharynx into the trachea. A mouth gag is inserted in the side of the mouth opposite the growth and a water-cooled retractor inserted on the diseased side. The tongue is held out of the way by a curved retractor.

The growth is attacked at the point at which it appears in the mouth either through the palate or from above the alveolar process. If it has not bulged the cheek or palate, an opening is made above the alveolar process as in the Denker operation. The soldering iron at a dull heat is used as a cautery; a red iron carbonizes and prevents the penetration of heat. The soldering iron is carried up gradually into the antrum and the entire growth is cooked thoroughly from thirty to forty-five minutes.

Since there is practically no bleeding in this treatment, the walls of the antrum may be inspected to determine whether or not the growth has been thoroughly removed. As the patient begins to awaken from the anæsthetic the irons are removed,

the mask is applied to the face, and the patient is again put to sleep with ether.

A knowledge of the pathology of the different types of malignancy is essential in determining the treatment. The rapidly growing sarcomata respond well to radium and do not require such thorough cauterization as the squamous-cell epitheliomata which are a most malignant type of tumor. The purpose of treatment is to eradicate the growth entirely at once by thorough cauterization followed by radium.

The author uses radium salts or the emanations in tubes which are introduced directly into the antrum at the point at which they seem most needed either at the time of operation or from ten days to two weeks later when some of the slough has cleared. He leaves 100 or 200 mg. from twelve to twenty-four hours within the antrum in addition to radium treatment outside the cheek with distance and screening. In all cases the dosage depends on the type of the malignancy, its duration, and its extent. The patient is kept under observation, returning every month or six weeks so that if a recurrence develops he may have immediate care. Such observation is very essential in order to control early recurrences. Any opening in the palate may be readily closed with prosthetic appliances.

Cautery and radium treatment of malignant tumors of the antrum have not been followed by any operative mortality or any postoperative complications of the chest. Two of the patients lost the eye on the side involved from the reaction to the cautery and radium, but in both cases the floor of the antrum was involved. The 10 patients who are well can not yet be considered cured, but they have been without recurrences for a period of months or years.

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# INTERNATIONAL ABSTRACT OF SURGERY

OCTOBER, 1920

## ABSTRACTS OF CURRENT LITERATURE GENERAL SURGERY—SURGICAL TECHNIQUE

### OPERATIVE SURGERY AND TECHNIQUE

**Pember, J. F.:** Skin Grafting. *J. Iowa State M. Ass.*, 1920, x, 181.

Skin grafting reduces the period of healing of denuded areas from months and years to weeks and days. Extremities which otherwise might require amputation because of cicatricial contraction may thus be saved. The grafting relieves suffering and may prevent death due to amyloid degeneration of the kidneys.

There are three methods of skin grafting: the Reverdin, the Wolf, and the Thiersch methods. When the Reverdin method is used the graft consists of a small portion of skin lifted with a needle and cut with a curved scissors. By the Wolf method a piece of skin sufficient to cover the denuded area is excised and all fat is removed from its under surface before it is placed over the wound. Necrosis usually follows if such a graft has a larger area than 36 cm. By the Thiersch method the graft is made by removing the upper layers of skin with a razor.

Grafts obtained from the same patient take best. When it is impossible to procure them from this source they may be taken from a donor who has been found satisfactory by a Wassermann test and tests of his blood against the patient's blood by the Moss method of blood grouping. Thiersch grafts must be obtained from a donor belonging to the same group.

The area from which the skin is to be taken is cleansed with benzene and washed with boric acid solution. The denuded area should be dry and smears should show less than six organisms to the field. Dakin's solution may be used to render the area practically sterile. The grafts should be carefully straightened out and care should be taken that there are no bubbles under them. The dressing may consist of a gauze covering impregnated with paraffine or gutta percha strips laid crosswise over the area. The dressings should be changed after several days.

I. E. BISHKOW.

**Prat, L.:** Diaphragmatic Hernia (Hernies diaphragmatiques). *J. de chir.*, 1920, xvi, 43.

The author gives the clinical history of a case of diaphragmatic hernia. The patient was a soldier who had a left lumbothoracic wound through which the omentum protruded.

An operation was done five days after the injury, but as at that time the author had no reason to suspect the presence of a gastric hernia, he merely resected the necrosed omentum and cleansed and drained the wound. This operation was followed by marked improvement but later peritonitis developed which was rapidly fatal. At autopsy a transdiaphragmatic strangulation of the stomach was found and two gastric perforations through which the contents of the stomach entered the pleura. The author believes that the perforations were due to circulatory disturbances produced by volvulus of the herniated organ.

In discussing the surgery of diaphragmatic hernia the author states that the thoracic route is to be preferred. The abdomen should be opened only when exploration of the herniated organs is necessary. In such cases Prat does not hesitate to section the lower border of the thorax.

If after resection of the sclerous edges the diaphragmatic orifice is too large to be sutured directly, suppleness and mobility of the diaphragm may be obtained by removing the portion of the thorax anterior to the herniation. Such a resection comprises ribs, intercostal muscles, and if necessary, the parietal pleura. The author has used this operation also in cases of purulent pleurisy. W. A. BRENNAN.

### ASEPTIC AND ANTISEPTIC SURGERY

**Taylor, W. H., and Taylor, N. B.:** Tidal Irrigation of Wounds by Means of Liquid-Tight Closure. *J. Am. M. Ass.*, 1920, lxxiv, 1700.

The authors have devised a rubber cap to be placed over the mouth of a wound through which, by means of two tubes, the wound can be alter-

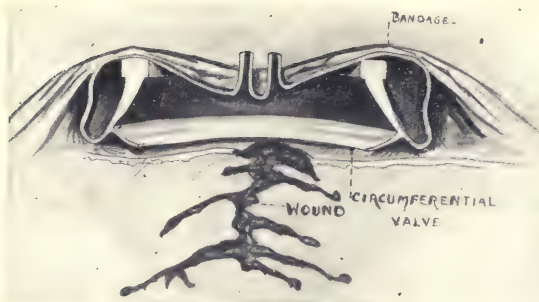


Fig. 1. Sectional view of a ragged wound covered by the appliance. The rubber cover is sucked down to the skin surface and the wound is shrunk in by the action of the negative pressure.

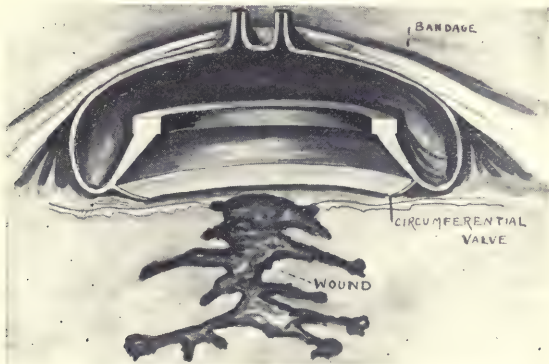


Fig. 2. Sectional view of the same wound as shown in Fig. 1. The wound cavity is dilated and the appliance distended by the action of positive pressure.

nately filled with fluid and aspirated without soaking the dressings.

In a foreword to the article Gallie states that this method of irrigating gave extremely satisfactory results in 200 cases in which he used it.

The device somewhat resembles a tam-o'shanter or a bathing cap made out of rubber. Two rubber tubes lead through the center of the crown. The part which would correspond to the head band is a rim of rubber which rests on the skin and forms a circumferential valve. As the irrigating liquid is forced into the appliance through one of the tubes this rubber rim is pressed more firmly against the skin around the edges of the wound.

The *modus operandi* is as follows:

The cap is lightly bandaged over the mouth of the infected wound. One of the tubes is connected with an irrigating flask and the other allowed to hang over the bed into a waste pail. The flask is filled with the solution to be used (the authors prefer a 10 per cent solution of sodium chloride but any antiseptic solution may be employed) and the flask is raised above the level of the wound sufficiently high to obtain a positive pressure which will

insure the flooding and distention of every corner of the wound. The outflow tube is clamped off and the wound allowed to remain distended for some time. The inflow tube is then clamped, the outflow tube opened, and by the siphonage action thus created the flooded wound is aspirated and subjected to a negative pressure.

This ebb and flow of fluid has a marked cleansing action on the wound secretion and the negative pressure induces hyperæmia and lymphorrhœa, increases phagocytosis, and causes the extrusion of bacteria.

R. B. BETTMAN.

Lee, W. E.: *The Chlorine Antiseptics*. *Ann. Surg.*, 1920, lxxi, 772.

The direct germicidal effect of all the chlorine antiseptics is dependent upon the liberation of their chlorine and the combination of this chlorine with bacterial protein.

The rapidity with which the hypochlorite solutions liberate their chlorine necessitates the presence of large masses of available protein (devitalized tissues and profuse wound exudate) or the use of very dilute solutions. Very dilute solutions liberate such a small mass of chlorine that their direct germicidal effect is almost negligible. Unlike the other chlorine antiseptics, however, they exert a very definite indirect germicidal effect by the formation of hydroxides which act as solvents of the culture material provided by devitalized tissues and wound exudate.

The synthetic chloramines are more stable compounds of chlorine than the hypochlorites and therefore can be used for larger germicidal masses or in greater concentrations. They act practically as reservoirs from which chlorine is slowly and automatically given off as the tissues present the necessary reacting substances.

The hypochlorite solutions are indicated in cases in which there are large masses of dead and devitalized tissues or profuse tissue exudates which cannot be removed by mechanical means. They should not be used if these are absent nor should they be applied to tissues poorly supplied with blood, tendons, or cartilage.

The chloramines are indicated when there is but little, if any, dead tissue, and when the wound exudate is moderate in amount. They are of value only as germicides. In the human tissues they liberate their chlorine slowly over a period of from three to twenty-four hours and in sufficient quantities to unite automatically with the bacteria and other proteins presented by the wounds.

I. W. BACH.

#### ANÆSTHESIA

Ross, E. M.: *Some Observations on the Occurrence of Acidosis after Anæsthesia*. *Canadian M. Ass. J.*, 1920, x, 548.

Ross found that the large majority of patients showing acetone and diacetic acid before operation had been ill for some time with infections, the toxæmias of pregnancy, or pathologic conditions causing vary-



ing degrees of starvation. Some were children who had not been actually ill, but had been undernourished for some time. Some of the latter were apparently healthy, but had gone through a period of starvation for twelve or eighteen hours.

In practically all of the emergency cases in which the intestinal tract was involved (with the exception of injuries) acidosis was found clinically and there were acid bodies in the urine. Both the amount of acid and the severity of the symptoms were in proportion to the length of time the patient had been ill before the operation. Patients who came to operation within twelve hours of the onset of an attack of appendicitis usually showed no symptoms and had only a slightly acid urine, while those who came to operation in from two to three days later, with abscess formation or peritonitis, usually had marked symptoms and more definitely acid urine. Whether this almost constant factor of acidosis in cases of acute abdomen is due to the presence of infection, as in appendicitis, or is the result of starvation and vomiting the author was not able to determine. He is convinced, however, that the presence of acid bodies in the urine in acute conditions does not contra-indicate operation but is an additional indication for surgical treatment.

The treatment of practically all of these cases in the author's opinion is simply a matter of feeding. To prevent the symptoms of acidosis patients should be well fed until the morning of operation. If the operation is to be done later in the morning they should be given a light breakfast and allowed to have water until within two hours of the operation. This of course does not apply to gastric surgery. Purgation is not advised; it has been found that an enema on the morning of operation is usually sufficient. The author does not believe that routine treatment with sodium bicarbonate is necessary. Such treatment is indicated, however, by a positive reaction in the urine for acid bodies and by clinical symptoms.

Following the operation the diet should be increased to normal as rapidly as possible. If acetone appears in the urine and especially if clinical symptoms develop, sodium bicarbonate in large doses and glucose should be given. If the condition is at all alarming these may be administered intravenously. In three of the author's cases in which vomiting was most distressing and persistent the vomiting ceased at once following intravenous injections of a sodium solution. In all of these cases the urine showed both acetone and diacetic acid which rapidly disappeared following the injection.

Ross suggests that all children should be overfed for some days before being sent to the hospital, allowed a full meal the night before operation, and given rich gruel and sugar early in the morning of the day of the operation. If the operation is not to be performed until late in the afternoon, breakfast should be given. Milk should not be allowed on the day of operation as it is apt to curd and cause trouble if the child vomits.

I. C. HERB.

**Delmas, P.: Spinal Cocainization in Operative Gynecology and Obstetrics** (De la rachicocainisation en gynécologie et obstétrique opératoires). *Rev. franç. de gynéc. et d'obst.*, 1920, xv, 145.

Delmas believes that the disfavor into which spinal anæsthesia induced with cocaine has fallen is due to faulty technique and the use of impure cocaine.

The drug must be pure and should not be dissolved until the moment that it is to be used. To prevent the irritating action of distilled water on the meninges, Delmas dissolves the cocaine in cerebrospinal fluid. The injection may be made into any of the spaces below the second lumbosacral vertebra, but the best area seems to be the lumbosacral space of Chipault. The instruments necessary are a trocar 7 cm. long and a 20 ccm. Luer syringe. The cerebrospinal fluid should be drawn off, mixed with 2 cgm. of the cocaine in the syringe, and then rapidly re-injected.

Delmas has performed 30 gynecological and obstetrical operations under cocaine spinal anæsthesia. The gynecological operations included the removal of the adnexa in 4 cases, 1 hysteropexy, 6 subtotal vaginal hysterectomies, 1 amputation of the cervix, 4 total hysterectomies by the upper route, and 8 total hysterectomies by the lower route. The obstetrical operations included 1 cesarean section and 2 high forceps operations.

Following the injection an immediate subumbilical anæsthesia is obtained, and as the motor nerves are not involved by the weak dosage the patient is able to obey instructions regarding her position and to aid in inducing uterine contractions.

The duration of the analgesia depends upon the amount of cocaine used. In obstetrical cases the effect of weak doses of cocaine on the fetus is negligible.

W. A. BRENNAN.

**Hirschfelder, A. D., Lundholm, A., and Norrgard, H.: The Local Anæsthetic Actions of Saligenin and Other Phenyl Carbinols.** *J. Pharmacol. & Exper. Therap.*, 1920, xv, 261.

To be of value as a local anæsthetic a substance must be of low general toxicity and possess a high degree of anæsthetic effect, an especially high selective action for the sensory as compared with the motor nerve fibers, and the power to induce anæsthesia of long duration. From all these standpoints, saligenin (salicyl alcohol) stands pre-eminent among the phenyl carbinols studied. It has the lowest toxicity, the least tendency to cause the formation of wheals or subcutaneous œdema, and the highest selective action in blocking the sensory nerves. Moreover, it produces an anæsthesia which lasts longer than that obtained with procaine or benzyl alcohol and quite as long as that obtained with any other member of the series.

Saligenin has been employed with excellent results in various operations such as tonsillectomies, excision of benign tumors, toe amputations, and operations for hernia.

SAMUEL KAHN.



**Rail, W. A.: The Continuous Administration of  $N_2O$  in Dental Surgery.** *Internat. J. Orthodont. & Oral Surg.*, 1920, vi, 375.

The obsolete method of inducing anæsthesia by means of pure  $N_2O$  without the admixture of oxygen or air is mentioned and condemned. A mixture of about 8 per cent of oxygen or 40 per cent of air with  $N_2O$  is recommended, the former for surgical, the latter for dental, operations.

Signs of anæsthesia should not include cyanosis or jactitation. Rebreathing is advocated when the respiration is shallow. Chloroform is recommended for old and stout persons, and ethyl chloride for

children under 10 years of age. In the cases of alcoholics the author uses gas and ether or a mixture of gas, chloroform, and ether.

The use of  $N_2O$  for old and stout persons and those suffering from arterial degeneration, large goiter, enlarged glands, or any neck condition causing difficulty in breathing is discouraged.

The author uses a nose and mouth inhaler consisting of a separate mouth and nose piece joined together by a patent rubber tube. The gas flows into the nose piece and then along the connecting tube into the mouth.

LOUIS SCHULTZ.

## SURGERY OF THE HEAD AND NECK

### HEAD

**Sachs, E.: A Few of the Problems in Neurological Surgery.** *South. M. J.*, 1920, xiii, 434.

Intracranial lesions should be recognized earlier. The reasons why intracranial cases come to the surgeon later than others requiring surgical interference are two in number:

First, the idea is still prevalent that cerebral syphilis, especially in the form of gummata, is a very common lesion. This is erroneous. While cerebrospinal syphilis, a disease affecting the meninges primarily, does occur frequently, a focal lesion of the brain due to syphilis is very rare, much more rare than a new growth. The misconception has often led to the institution of a prolonged course of anti-syphilis treatment, and during this time a neoplasm is able to make tremendous headway. The rule laid down by Horsley in the early nineties—that from four to six weeks should be ample time to demonstrate the efficacy of energetic treatment for syphilis—holds good today.

The second reason for the late diagnosis of intracranial lesions is that the triad of symptoms, headache, vomiting, and choked disc, is still awaited.

Choked disc is occasionally caused by syphilis and as a rule patients with choked disc and a positive Wassermann or an undoubted history of syphilis are first given anti-syphilis treatment to relieve the condition. Whenever a choked disc is discovered, however, it is most important first of all to relieve the intracranial pressure by a decompression operation. Only then, if syphilis is the underlying cause, should anti-syphilis treatment be instituted.

Another group of cases which have proven of great interest in neurological surgery are those presenting focal lesions of the spinal cord. Such cases should be considered from the surgical standpoint. It is no longer justifiable merely to make a diagnosis of transverse myelitis. Transverse myelitis is not a pathologic entity. Its underlying cause should be determined and if it cannot be overcome by some other therapeutic measure, an exploratory laminectomy is indicated.

H. A. McKNIGHT.

**MacLennan, A.: The Repair, by Bone Graft, of Gaps in the Skull Due to Congenital Deficiency, Injury, or Operation.** *Glasgow M. J.*, 1920, n. s. xi, 251.

Wide removal of bone has given the best results in cases of gunshot wounds. Discrimination is necessary, however, in determining the extent of such removal. It is, of course, essential to obliterate the septic region, if possible, but in many cases this does not necessitate wide clearance of bone. Free exposure of the brain is beneficial as it constitutes a very complete decompression.

The patient's safety is increased when the brain has a rigid covering. Such a covering should be composed of bone rather than of metal or celluloid. The less foreign material left in the wound the better. The author has adopted the use of the autoplasmic bone graft as the ideal solution of the problem. The technique of the inlay by bone is as follows: An incision is made following the line of the scar which, if feasible, is excised. No special means such as the use of elastic or a metal tourniquet is taken to control hæmorrhage. The scar and flap are raised from the region of the gap most carefully in order to avoid opening the subdural space. In many instances this necessitates splitting the scar on the flat. The dura must be freed all round the inner surface of the gap margin and the eburnated edge of the gap refreshed with rongeur forceps. The graft is then obtained from the scapula. An incision is made over the infra-spinatus fossa parallel with the muscle fibers which are separated until the bone is reached. A graft of requisite size and shape is cut out with the osteotome or gouge. It is then fitted into the opening in the head so that it is entirely within the skull, resting upon the separated dura and the inner table. Firm fixation results from the intracranial pressure exerted by the expanding brain. To obtain an accurate fit of the graft it may be necessary to bend or fracture it. After its insertion the skin edges are sutured over it. The graft is obtained from the scapula because no disability follows scapular mutilation and the bone is eminently suited for the operation.

H. A. McKNIGHT.



**Mummery, S.: A Successful Case of Bone Grafting.** *Proc. Roy. Soc. Med.*, Lond., 1920, xiii, Sect. Odont., 78.

The case reported was a severe shell wound of the face presenting a large opening on the right side of the mandible which admitted three fingers. The X-ray findings showed an extensive comminuted fracture on the right side from the canine back as far as the angle, a fissure extending from this region up the ascending ramus nearly to the sigmoid notch, and a fracture of the neck of the condyle.

The right second and third molars, which were involved in the fracture, were removed. Cast metal splints were then cemented to the upper and lower teeth and these were wired together. A rib graft was then inserted, mortised at each end, and firmly fixed by pegs cut from the same rib.

After one year and twenty-three days the patient was discharged from the hospital with a fully efficient jaw which opened to a normal extent and possessed excellent masticating function.

Two features of interest in this case are the development of an attack of tetanus which nearly proved fatal and delayed treatment of the fracture, and the occurrence of prolonged sepsis after the graft had been inserted, which cleared up entirely.

LOUIS SCHULTZ.

**Jorge, J. M.: Palliative Trephining in Cerebral Processes** (*La trepanación paliativa en los procesos cerebrales*). *Rev. Asoc. méd. argent.*, 1919, xxxi, 568.

If hypertension occurs during the first few months or even during the first few years of life, hydrocephalus results. When ossification of the cranial bones is complete, however, this distention is not possible and the increase of pressure of the cerebrospinal fluid is manifested by a syndrome of cephalalgia, vomiting, mental torpor, slow pulse and respiration, and choked disc. Meningitis either acute or chronic, may cause an increase in intracranial pressure of such intensity that decompression is necessary. Palliative trephining is of value in such cases because it affords temporary relief during the course of treatment and often prevents the blindness which would otherwise result.

Trephining is especially valuable in cases of intracranial pressure which do not yield to lumbar puncture. Many cases of syphilis with cerebral manifestations which have not yielded to even intense specific therapy have shown immediate improvement under such therapy following a decompression. This is explained by the fact that decompression plays an important rôle in the improvement of the cerebral circulation which in turn produces more favorable conditions for the cure of the original lesion.

Indications for the operation are more definite in cases of cerebral tumors. According to the most recent statistics only between 10 and 15 per cent of cerebral tumors may be extirpated. The remainder are benefited by a palliative operation which not

only prolongs life but makes the patient more comfortable. Decompression is always indicated, and when possible the tumor should be removed. The author gives the details of five cases in which cerebral tumors were successfully removed. From his experience he concludes that decompression should not be delayed when hypertension begins to menace the vision. Distinct brain lesions of undetermined nature, specific or non-specific, may be modified by decompression so that all grave phenomena disappear with the hypertension.

The benefits of decompression are observed also in cases of cerebral traumatism with focal symptoms, and very definite indications for the operation are seen in cases of coma from cerebral hæmorrhage. Five or six hours after the onset there is œdema of the affected hemisphere which increases the pressure exerted by the extravasated blood, and both the blood and the œdema exert pressure upon the sound side, compressing its convolutions upon the cranial wall. Decompression performed on the sound side results in the clearing up of the coma.

When it is impossible to discover the location of a tumor of the brain or to remove the growth when it is found a decompression operation at the site of election is indicated, not as treatment of the tumor, but for the relief of the vomiting, headache, choked disc, etc.

W. R. MEEKER.

**Kerr, H. H.: The Late Treatment of Gunshot Wounds of the Head.** *Surg., Gynec. & Obst.*, 1920, xxx, 550.

Wounds of the skull involving the brain result in two types of disability: one due to the skull defect *per se*, and the other due to the injury of the underlying tissue. Therefore the treatment of such cases should be considered from two points of view, that of surgery and that of neurology.

Surgery can overcome only the mechanical defect and its immediate results. To a greater or less degree, however, all of the cases present the "defect syndrome." The patients are morose and retiring and suffer more or less from headaches. Stooping over or turning suddenly causes dizziness. Loud noises are extremely irritating. Exposure to the sun results in headache and prostration.

The defect syndrome can be improved or cured by the correction of the cranial defect. The author operates with the patient under local anæsthesia and in the head-high position. This materially reduces hæmorrhage and lessens the bulge of the associated cerebral hernia. The graft is sewed to the pericranium with the bone surface inward. The operation is delayed for at least eight months after healing. The technique is as follows: A subglacial injection of 1 per cent novocaine solution is made about the depressed scar, the bone defect is exposed, and the edges are freshened with a chisel. A linen pattern of the defect is then laid on the neighboring pericranium as a guide to the chiseling off of an osteoperiosteal graft. The graft is sewed to the defect with the bone surface inward.

The effect of this operation is most encouraging. The patient becomes bright and active and attacks the problems of re-education with hopeful vigor. The dizziness is relieved and in the majority of cases the headache disappears. The graft protects the brain from the sun and the irritation of loud noises.

In cases of gross spastic paralysis daily massage and splinting are instituted at first, contracted muscles are stretched, and passive motion is given to stretch the contracted flexors. At a very early date the patient is gotten out of bed and urged to walk. At first extent of motion; later, force of motion; and, finally, rapidity of motion are obtained by means of exercises.

Experience based on a large number of cases of cerebral paralysis has most strikingly demonstrated that much more can be done for such cases than is commonly supposed. With proper appreciation of this fact we should be able to re-educate every patient with traumatic cortical injury to such a degree that practically no permanent disability remains.

H. A. MCKNIGHT.

**Drachter, R.: The Treatment of Congenital Lateral Harelip** (Richtlinien fuer die Behandlung der angeborenen seitlichen Lippenspalte). *Zentralbl. f. Chir.*, 1920, xlvii, 194.

Harelip of the first and second grade does not generally require immediate or early surgical treatment, the best time for operation in such cases being usually after the first half year. Cases of harelip complicated with cleft palate should be operated on when the child is between six and eight weeks of age if its body weight is normal and there is no other intercurrent disease. Breast-fed infants should not be weaned.

The operation is performed under local anesthesia, not in the hanging head position, and the operative field is disinfected with alcohol. The upper lip is loosened from the upper jaw, and a flap of red tissue is formed on either side, the edges of which are equidistant from the edge of the wound. The cleft edges are freshened and buttonhole stitches of silk are made, the first stitch at the base of the flap where the red and white tissue meet, the second through the tip of the flap, and three or four through the entire thickness of the lip. These are tied from below upward. No dressing is applied. In cases of double harelip the other side is operated upon six or eight weeks later.

STETTINER (Z)

**Stobie, H.: A Case of Osteomyelitis of the Mandible.** *Proc. Roy. Soc. Med.*, Lond., 1920, xiii, Sect. Odont., 70.

Following the extraction of an aching upper tooth the pain increased rather than diminished and the left cheek and side of the neck became swollen. One week later several lower teeth were extracted, but the swelling increased and spread under the chin.

Multiple abscesses then formed. These were opened. Openings were made also under the chin and behind the angle of the mandible on either side

and drainage tubes inserted. A large quantity of thick yellow foul-smelling pus was discharged.

The X-ray findings were suggestive of diffuse osteomyelitis.

The treatment consisted of frequent syringing with carbolic acid and liquor potassii, the application of hot fomentations every three hours, and enlargement of the sinuses to provide ample drainage. Three months later a sequestrum was removed which comprised practically the whole outer left side of the body of the mandible from the symphysis to the angle. Marked local and general improvement followed, but six weeks later the discharge and swelling increased.

Bone was felt at the bottom of the sinus at the left angle and X-ray examination showed separation of a large portion of the left ramus but new bone on the lingual aspect. As the symptoms were severe, the sequestrum was freed by blunt dissection and removed. This sequestrum proved to be the condyle of the left ramus with the exception of the coronoid process. The remaining mandibular teeth were removed subsequently and six weeks later all the sinuses had closed and the movements of the jaw were normal. With the aid of a denture the patient was able to masticate.

The X-ray then showed that the bone consisted of a homogeneous tissue and was considerably narrower from side to side than when it was rayed at the beginning of treatment.

The progress made and the result obtained in this case demonstrate that it is better to wait for sequestra to separate than to remove them immediately by operation.

LOUIS SCHULTZ.

## NECK

**DeRaffele, F.: A Clinical Case of Arteriovenous Aneurism of the Internal Carotid in Its Extracranial Segment** (Su di un caso clinico di aneurisma arterovenoso della carotide interna nel segmento extracranico). *Riforma med.*, 1920, xxxvi, 345.

The case reported was that of a soldier and was diagnosed before death. Operation seemed contraindicated by the patient's poor general condition but it is doubtful whether surgical treatment would have been of benefit.

The author discusses in detail the diagnosis and the methods of determining the location of the lesion. Dicrotism limited to the right radial pulse is a constant phenomenon of this anatomopathologic type of aneurism and the expression of a lowered blood pressure and relaxation of the arterial walls. The blood depression is the essential factor. In the author's case the dicrotism of the right pulse was correctly interpreted to be the effect of the depression produced by the abnormal carotid-jugular communication.

In determining the location of the lesion in the internal carotid the pharyngeal findings are of the greatest importance. In the author's case there was complete synchronism between the right and left temporal and the right and left facial arteries. This



seemed to indicate that the aneurism was in the external carotid but pharyngeal exploration established the fact that it involved that portion of the internal carotid which lies between the origin of the vessel at the upper border of the thyroid cartilage and the carotid foramen at the base of the cranium.

Although involvement of the third, fourth, and fifth cranial nerves seemed indicated by slight facial paralysis, exophthalmia, ptosis, and dysphonia, the author believes these symptoms were due to the anatomical disposition of the aneurism, the course of the projectile causing the lesion, and compression of the vagus fibers directed toward the sensory and motor innervation of the larynx.

W. A. BRENNAN.

**Reid, M. R.: Adenomata of the Carotid Gland.**  
*Bull. Johns Hopkins Hosp.*, 1920, xxxi, 177.

In 1915 Steindl reported a carefully studied case of adenoma of the carotid gland and collected 41 others from the literature. Recently Reenstierna reported 2 cases and found additional records in the literature which brought the total number of cases reported to 66. Reid's article is based on 3 others. Two of these he operated upon himself. The third was operated upon by another surgeon who sent him a specimen of the tumor for diagnosis.

According to Reid, the slowly growing pigmented tumor of the carotid gland, heretofore described as "carotid body tumor," is a simple hyperplasia of a part or all of the normal gland and may be designated as an adenoma. In rare instances a malignant condition develops within it.

A "potato tumor of the neck" is sometimes a primary sarcoma or carcinoma of the carotid body.

The relation of the common carotid artery to enlargements of the carotid gland is of value in the diagnosis. This artery was caught and carried laterally or anteriorly so that with its branches it was often readily felt on the surface of the tumor.

Bulging of the pharyngeal wall and paralysis of a vocal cord are frequently observed in an enlargement of the carotid body. The paralysis is detected only by direct examination of the cords inasmuch as disturbances of speech are not usual.

Yellowish pigmentation of the body, flushing of the head and neck, and a slow, somewhat apathetic state of mind result from hyperplasia of the carotid gland.

The mortality of operations for the condition is very high. Partial or complete preliminary ligation of the carotid artery and care in obtaining hemostasis at the second operation, however, reduce it materially.

In some cases in which an operation was imperative on account of the size of the growth the author found it better to do a decompressive operation than to attempt extirpation of the tumor. After the tumor was dislocated laterally and had become more superficial its removal was easier and safer, particularly if the artery had been tied at the time of the decompression operation.

G. E. BEILBY.

**Stierlin and Von Meyenburg: Progressing Thrombosis and Embolism in the Internal Carotid Region following Contusion and Ligation** (Die fortschreitende Thrombose und Embolie im Gebiete der Carotis interna nach Kontusion und Unterbindung). *Deutsche Ztschr. f. Chir.*, 1920, clii, 1.

Stierlin and Von Meyenburg report 5 cases of thrombosis and embolism in the carotid region which followed contusion and ligation and presented the symptoms of an intracranial hemorrhage. In every case except 1, that of a patient who recovered, the diagnosis was confirmed by autopsy.

Following an injury of the intima and media of the internal carotid by a glancing bullet a thrombosis may form if the continuity of the wall is not impaired. If the arterial lumen becomes obliterated by the thrombus an ischemic softening may occur in the region of the artery of the sylvian fossa, causing the symptoms of a hemiplegia and, when situated on the left side, also an aphasia. As the entire syndrome develops slowly, a mistaken diagnosis of intracranial hematoma is made easily. If the thrombus grows peripherally and closes up the collaterals of the circle of Willis ischemic softening of the corresponding part of the brain results. The etiology of the increased coagulation of the blood is still unexplained.

The authors observed also a case of retrograde thrombosis of the common carotid, internal carotid, and median cerebral arteries after ligation in a case of Basedow's disease. This thrombosis led to softening of the brain. The increased coagulation of the blood was especially interesting in this instance as usually lowered coagulability is characteristic of Basedow's disease.

The prognosis is more favorable if at the site of the injury a mural thrombus forms from which only small emboli can be carried away (Case 3).

The author concludes that as ligation of the carotid may be followed by embolism, especially if it is done in an infected area, and as the procedure is itself more or less dangerous to the brain, it should be performed only when no other method is possible.

KOLB (Z).

**Homans, J.: Accidents and Precautions in Ligation of the Common Carotid Artery.** *Ann. Surg.*, 1920, lxxi, 707.

The author reports the case of a man 24 years of age who received a bullet wound in the neck in which the blood vessels were injured. At operation the common carotid artery was ligated. Fatal hemiplegia resulted. Following this case report and a review of the literature, Homans summarizes his conclusions as follows:

Whenever an injury to the common carotid is suspected the quality of the emergency collateral circulation and the strength of the arterial circulation as demonstrated by the blood pressure and the apparent degree of shock should be determined. Ligation of the common carotid artery should be done only in cases of external hemorrhage



and dangerous extension of the local hæmatoma and when all the circumstances appear favorable for the formation of a collateral cerebral circulation. The surgeon should be prepared to make a temporary or permanent repair of the common carotid when temporary occlusion induces immediate cerebral symptoms. The jugular vein should be ligated before or during occlusion of the artery, blood transfusions should be given when necessary, and a local anæsthetic used whenever possible. If operation is delayed there is a greater likelihood of injury to adjacent nerves but less danger of cerebral complications.

E. C. ROBITSHEK.

**Plummer, W. A., and Broders, A. C.: Tuberculosis of the Thyroid.** *Minnesota Med.*, 1920, iii, 279.

The authors divide the literature on tuberculosis of the thyroid into three classes: (1) reports of cases in some of which both clinical and pathologic examinations show that secondary infection and abscess formation have modified the gland; (2) accounts of histologic findings in the thyroids of persons who died of general miliary tuberculosis; and (3) studies on the pathology of simple and exophthalmic goiters. Mosiman reported nine cases from the Crile Clinic and called attention to the striking relationship between hyperthyroidism and tuberculosis of the thyroid. Either the hypertrophic gland has a lowered resistance against the tuberculosis bacillus or the infection stimulates the parenchyma to an abnormal activity and is thus indirectly responsible for the hyperthyroidism and its attendant symptoms.

In the seven cases observed at the Mayo Clinic the clinician and surgeon had been unable to diagnose tuberculosis of the thyroid previous to microscopic examination of the glands. Patients with tuberculosis of the thyroid may be divided into three groups: (1) those with a high degree of hyperthyroidism, (2) those with a moderate degree of hyperthyroidism, and (3) those in whom hyperthyroidism is mild or absent. Two of the reported cases belonged to Group 1 and represent typical high-grade exophthalmic goiters from which they could not be distinguished. The pathologist reported extensive parenchymatous hypertrophy with tuberculosis in certain areas. The single case in Group 2 represents an intermediate stage in which the hyperthyroidism is less severe. Pathologic examination showed a fair degree of parenchymatous hypertrophy and very extensive tuberculous involvement. With one exception the four thyroids of the patients in Group 3 were smaller than those of the patients in the other groups. The clinician had recognized an unusual condition in all and had suspected carcinoma in three. In this group of patients the condition may be at least suspected before operation, but must be distinguished from simple thyroiditis and malignancy of the thyroid.

The fact that the greater the tuberculous involvement the less severe the toxic symptoms may be explained by the more extensive destruction of

the gland. Five, and probably six, of the patients were suffering from hyperthyroidism, but there was nothing definite to indicate that tuberculosis preceded the hyperthyroidism.

The usual thyroidectomy is of doubtful value in these cases and hypothyroidism may result.

One of the seven patients whose cases are reported by the authors is in perfect health two years after a thyroidectomy; one has myxœdema; and two others have not been heard from recently. In the other three cases the postoperative period is not yet of sufficient length to warrant conclusions as to the prognosis.

M. B. KELLOGG.

**Loeb, L., and Hesselberg, C.: III. Studies on Compensatory Hypertrophy of the Thyroid Gland: (a) The Effects of Homoiotoxins on Hypertrophy of the Thyroid; (b) Change in Weight in the Host as a Factor in Compensatory Hypertrophy; (c) Phagocytosis in the Hypertrophic Thyroid Gland.** *J. Med. Research*, 1920, xli, 283.

The questions which the authors wished to answer in this article are as follows:

1. Did the effects of homoiotoxins which they had previously established and which concerned lymphocytes, fibroblasts, and capillary vessels affect the compensatory hypertrophy?

2. Had the homoiotoxins a direct effect on compensatory hypertrophy, in addition?

3. Conversely, did compensatory hypertrophy modify the usual effects of homoiotoxins on the transplants?

Their answers are based on a long series of experiments along these lines, the results of which they summarize as follows:

1. The homoiotoxin did not prevent the effect of the growth substances which cause hypertrophy of the thyroid gland, but diminished it. In this respect the action of the homoiotoxin was similar to that observed in the case of a substance given off by the corpus luteum which called forth the development of decidualmata. Homoiotoxin did not prevent the formation of decidualmata, but diminished their frequency and size.

It therefore may be concluded that homoiotoxins not only interfere with regenerative processes which take place in response to injury, but also with the chemical action of growth substances. The homoiotoxin exerted this effect on the thyroid gland mainly through the homoioreaction as expressed in the activity of lymphocytes, fibroblasts, and vessels. There was no indication that the homoiotoxin had a directly injurious effect on the processes which lead to hypertrophy. However, the main effect of the homoiotoxin consisted in the calling forth of a secondary destruction of the thyroid tissue which had become hypertrophic. This destruction took place principally by means of the lymphocytic reaction and less through the action of fibroblasts.

2. The hypertrophic changes in the thyroid did not essentially alter the individuality-specific



homoio-differentials. The homoio-reaction was as marked in the hypertrophic as in the normal gland.

3. The homoio-differential depended upon the relationship of the host and donor. When the homoio-reaction was very weak it was probable that the differential was a syngenesio-differential instead of a homoio-differential.

4. A considerable loss of weight, in one case amounting to as much as 19 per cent of the total weight of the animal and to a loss of 11 per cent in the unit time, did not necessarily prevent hypertrophy of the thyroid gland. A loss of weight sufficiently great to call forth the production of hypotypical ovaries sometimes permitted the hypertrophic changes. On the other hand, the evidence made it at least probable that a gain in weight was more favorable for the occurrence of hypertrophy than a loss.

5. After an injury of the thyroid gland particles of blood pigment sometimes appeared in the acinus cells as well as in phagocytes which were found in the lumen of the acini. These granules seemed to persist longer in the acinus cells than in the lumen of the acini; they were especially apt to appear in hypertrophic cells and were never seen in normal glands. In this case it was probable that there was phagocytic activity on the part of the thyroid cells. It was probable also that all cells which were capable of amœboid movements were capable also of phagocytic activity.

G. E. BEILBY.

**Barnhill, J. F.: Surgery of the Thyroid.** *J. Am. M. Ass.*, 1920, lxxiv, 1558.

According to Barnhill, the most plausible theory of the etiology of goiter is that which attributes the condition to infection. Many physicians contend that thyroid disease may arise in the throat, and a clinical study of numerous cases of goiter in which there were foci of infection in the throat and mouth furnishes abundant evidence in support of this assumption. In disease of the thyroid the intimate relation of the enlarged gland to the upper air tract is usually much increased and gives rise to a multiplicity of symptoms, chiefly respiratory.

In view of this relationship of the throat to disease of the thyroid body and the fact that the growth of laryngology has been in the direction of cure by surgical methods, the assumption of surgery of the thyroid by the laryngologist is to be expected and perhaps may prove helpful.

Especially in certain types of cases surgery of the thyroid must be based on the most accurate diagnosis possible.

Modern operative technique and surgical training and skill have reduced the mortality of goiter surgery to almost nothing.

Plummer classifies goiters into non-toxic, toxic non-exophthalmic, exophthalmic, and malignant. Undoubtedly many non-toxic goiters should not be operated upon, especially if they are of only moderate size and do not give rise to symptoms. Both

thyrotoxic and exophthalmic goiters present pre-operative problems that as yet have not been satisfactorily solved. Undoubtedly in numerous cases there is a well-marked, exceedingly dangerous, and troublesome thyrotoxicosis with no enlargement or only slight enlargement of the thyroid gland. Such cases are characterized by pronounced nervous symptoms, tachycardia, and loss of weight and have sometimes been diagnosed as hysteria, neurasthenia, heart disease, or nervous prostration. In the treatment the surgeon needs the assistance of a thoroughly trained diagnostician.

When once the definite diagnosis of surgical goiter has been made the operation should be performed as soon as possible. In all cases of non-toxic goiter, unless some other associated disease contraindicates operation, the goiter may be removed when the patient has been surgically prepared. In cases of toxic and exophthalmic goiter the patient's vitality may be so impaired that a long period of preparation is necessary before operation may be performed with safety. Rest, both mental and physical, to overcome the increased metabolism is essential. Rest in bed at home is not always helpful rest. Often, also, attempts to obtain rest in the hospital fail and the toxic state becomes worse. In such cases it is probable that the safest time for operation has arrived when the metabolic rate is reduced to one-third above normal and the pulse rate to below 120.

In regard to the anæsthetic to be employed experienced surgeons hold different views. In the author's opinion ether is the ideal anæsthetic in goiter surgery.

An important factor of safety in the operation is the limitation of the loss of blood. Not much blood can be lost as the patient is anæmic and therefore the drain of an amount that would be harmless in other cases would prove fatal under these conditions.

In removing the gland the author has found that in some cases at least it is entirely possible to strip the parathyroids from the posterior capsule and thus remove the entire capsule. He does this by working from the upper pole downward, doing the stripping by means of a piece of gauze and keeping directly against the smooth, shiny glandular capsule. By this procedure the recurrent laryngeal nerve is protected from injury. Barnhill does not advocate the routine removal of the entire capsule, however, as the parathyroid bodies are sometimes embedded in it or lie completely within the gland and in such cases would be endangered or removed by such a procedure.

The question frequently comes up as to when ligation should be done. Ligations are indicated only when the removal of a necessary amount of the thyroid gland would be hazardous. Since this danger arises in only two types of goiter, the highly vascular and the severely thyrotoxic, it is evident that ligations are justified only when one of these conditions is present, and in the latter case only when

the metabolic rate is high, the patient is greatly exhausted, tachycardia and arrhythmia are marked, and, in general, a state of collapse is imminent.

Improvement following ligation does not usually continue to the point of final cure. After a varying period of time the blood and nerve supply to the gland is more or less restored and the former hyper-toxic state again sets in. Before this period arrives complete thyroidectomy should be done if it is reasonably safe.

In removing the gland one of the most important questions the surgeon must settle is how much he should remove. This must be determined on the basis of his own experience.

The author's experience in the surgery of the thyroid is based on 150 cases in which the observations were made somewhat from the point of view of the laryngologist rather than from that of the general surgeon. He has corresponded with or has seen most of the patients months or years after the thyroidectomy and not one has expressed dissatisfaction with the results of the operation after two years.

In the last six years Barnhill has kept notes as to the presence of diseased tonsils in goiter cases. More than 90 per cent of the cases he examined showed such disease. In more than 50 per cent of his cases of goiter in which operation was performed during this period the tonsils were removed before the thyroidectomy, sometimes as long as a year previously, in the hope that the goiter operation might thus be avoided. It is the author's belief that after the thyroid is once diseased the removal of the tonsils has little appreciable effect on the thyroid condition.

G. W. HOCHREIN.

**Hubeny, M. J.: The X-Ray Treatment of Exophthalmic Goiter.** *Illinois M. J.*, 1920, xxxvii, 383.

The treatment of exophthalmic goiter and other forms of thyrotoxicosis by the roentgen rays is of definite value when it is properly given. Numerous workers have obtained gratifying results as regards amelioration and cure, the percentages of cure being so satisfactory as to invite a more universal application of the method.

The author uses two techniques which he describes as follows:

Technique 1. Interrupterless machine, broad focus Coolidge tube. Parallel spark gap 9 in. The rays are filtered through 4 mm. of aluminum and

1 mm. of leather. The skin focus distance is 8 in. Three areas are treated at each sitting, each area receiving two-thirds of an erythema dose. Areas treated: (1) right half of goiter; (2) left half of goiter; (3) thymic region. This constitutes one treatment. Treatment is repeated in three weeks. After one series of such treatments none is given for three months. A second series is then given, and if necessary, a third series after an interval of three months.

Technique 2. Interrupterless machine. Broad focus Coolidge tube; 9 in. parallel spark gap, 4 mm. of aluminum filtration, 1 mm. of leather filtration. Skin focus distance 14 in. Sitzings 3 to 6. Areas treated: (1) right anterior thyroid; (2) left anterior thyroid; (3) right anterior thymus; (4) left anterior thymus; (5) right posterior cervical ganglion area; (6) left posterior cervical ganglion area. Dose, one-half erythema over each area. The same frequency of repetition as in Technique 1.

Technique 2 is one of choice when the patient is not highly toxic, permitting a gradual recrudescence of symptoms with less tendency toward recurrence. The areas over the cervical ganglia are included because of Cannon's observation that stimulation of these centers causes secretory activity in the thyroid, while the effect of the X-ray seems to inhibit their action. When because of such conditions as cardiac debility or marked thyrotoxicosis immediate results are desired. Technique 1 is to be employed.

The earlier the treatment is begun the sooner the response to roentgenotherapy. The favorable signs are the abatement of the nervous symptoms, a gain in weight, slowing and stabilization of the pulse, and a decrease or disappearance of the exophthalmos in about 40 per cent of the cases. The goiter may or may not decrease in size.

Some of the undesirable and dangerous possibilities are hypothyroidism and telangiectasis and atrophy of the regions treated. These changes are more apt to occur when unfiltered rays are used or repeated erythema is produced. The first treatment may increase the toxæmia to a dangerous degree. To guard against this the patient should rest in bed before the treatment is begun and at first only small doses should be given. When surgery has been employed and has not resulted in a complete cure, great caution is necessary as the danger of hypothyroidism is greater. The treatment should not follow operation too soon and should not be prolonged.

ADOLPH HARTUNG.

## SURGERY OF THE CHEST

### CHEST WALL AND BREAST

**Young, R. F.: Penetrating Gunshot Wounds of the Chest.** *Glasgow, M. J.*, 1920, n.s. xii, 193.

Young reports a series of 82 consecutive cases in which the pleura had been penetrated by a foreign body. These cases were treated at a base hospital

from the middle of August to the end of October, 1918. Forty-seven of the injuries (57.2 per cent) were bullet wounds and 35 (46.2 per cent) were due to fragments of shell or shrapnel. In the former, the bullet had penetrated the chest, causing entrance and exit wounds in nearly 90 per cent. In about 10 per cent the missile had failed to pass out.



In every case in the series some intrathoracic change was discovered. When the lung had been penetrated or bruised, hæmoptysis was a constant sign.

Ten patients had subcutaneous (surgical) emphysema on their arrival at the hospital. In 7 cases it was associated with entrance and exit bullet wounds, all of which were complicated by fracture of ribs. Soltau and Alexander consider the presence of subcutaneous emphysema as a "favorable sign, a safety valve preventing pneumothorax which has rarely been found associated." In the 10 cases pneumothorax was present in 5, the diagnosis being corroborated by X-ray examination.

Hæmothorax was present in 71 cases (86 per cent), in 21 of which there was also pneumothorax. It is probable that the hæmorrhage was pulmonary in origin as in all the cases except 2 in which the lung had been penetrated a hæmothorax was present, whereas in 9 cases, in which the pleura had been penetrated but the lung uninjured, hæmothorax was absent.

Breathlessness was a constant feature, especially after slight exertion. The majority of the patients arrived at the hospital with some degree of pyrexia. A few had subnormal temperatures, but soon became feverish after a rest. The duration of pyrexia unassociated with sepsis varied from six to seventeen days from the time of the receipt of the wound. In the majority of cases it lasted about eight days.

The physical signs were very complex. Dullness was always present and the X-ray showed that the diaphragm was higher on the affected side. Skodaic resonance was commonly found above the level of the fluid. Egophony and pectoriloquy were frequently noted in a small resolving hæmothorax and were regarded as favorable signs. In a few cases of large hæmothorax the vocal resonance was increased, but this was unusual. In every case there was weakness or absence of the breath sounds. The breathing was tubular in only 4, and in these cases the hæmothorax was small and undergoing resolution, giving only a slight opacity to the X-rays and soon clearing up.

In the postmortem examinations collapse of the lung below the upper limit of the fluid was found when hæmothorax was present and was generally associated with some emphysema and always with œdema of the non-collapsed portion.

There were 21 cases of pneumohæmothorax, 18 of which were of the simple variety and 3 due to gas-forming bacilli. The most conclusive method of diagnosing the condition was the X-ray examination.

Pneumothorax not associated with hæmothorax was found in only 1 instance, a case in which there was an entrance and exit bullet wound with fracture of the seventh, eighth, and ninth ribs. The X-ray plate showed hæmorrhagic infiltration of the middle lobe and considerable displacement of the heart.

Hæmorrhagic infiltration of the lung was found in 9 cases, generally by X-ray examination, and in all it

coincided with the probable path of the bullet or shrapnel ball.

The complications in the uninjured lung included acute congestion and œdema following operation in 1 case, œdema which was found postmortem in 2 cases, and an "increased density" which was shown by the X-ray in 3 cases. In 1 case in which the foreign body lodged in the right side and caused a sterile hæmothorax a sterile serous effusion occurred on the other side, and in another case in which the X-ray showed very marked density in the not wounded side the increased density was proved at the postmortem to be due to old pleuritic adhesions.

Fractured ribs were present in 28 cases.

In 7 cases the missile entered the abdomen after penetrating the chest. In 2, the spleen was wounded and both of these patients died, one from gas-bacillus infection of the chest, the other from secondary hæmorrhage of the spleen. In 3 cases the liver was involved. In 2 of these the foreign body was left in the liver untouched. All 3 patients recovered. In 2 cases the missile passed from the chest into the abdomen without giving rise to any abdominal symptoms. Both patients recovered. In 1 case the fragment of shell had passed in the reverse direction, lodging in the lung after doing considerable damage in the abdomen. Death resulted from peritonitis.

Fourteen cases were complicated by additional wounds elsewhere. None of these, however, affected the chest condition.

Of the 42 entrance and exit bullet wounds, 8 (20 per cent) became infected. Two (40 per cent) of the 5 wounds which were produced by lodging bullets and 10 (30 per cent) of the shell wounds were infected. Three of the infections were staphylococci; all of the patients recovered. Two were streptococci infections, and of these, 1 was fatal. One patient with a combined staphylococci and streptococci infection and 2 with a combined streptococci and pneumococci infection recovered. In 5 cases of mixed aerobic and anaerobic infection there were 2 deaths. In all of these the anaerobe was the bacillus welchii. There were 2 cases of anaerobic infection (bacillus welchii) with recovery. Three cases of bacillus welchii and bacillus sporogenes infection resulted in 2 deaths. Two infected patients with discharging sucking wounds died shortly after their admission to the hospital but no bacterial examination was made.

A rule to which the author found no exception was that patients with penetrating wounds of the chest showed some signs of pulmonary distress on their arrival at the base hospital. For this reason the primary examination was made as brief as possible. When it was evident that immediate interference was not necessary the first part of the treatment consisted of complete rest to overcome the unfavorable effects of the journey. The patient was placed in whatever position he found the most comfortable and was given  $\frac{1}{4}$  gr. of morphia.

Following a complete rest a more thorough examination was made. This included a physical



examination, and when possible, an X-ray examination. If a comparatively large hæmothorax was present the chest was explored by means of a syringe with a long, fine needle and the fluid was sent for bacteriological examination.

On the basis of the findings of the examination the cases naturally fell into two groups, those which required operation, and those which did not.

If a sterile hæmothorax was present the indications for interference were the same as those in an ordinary pleural effusion. Aspiration was done in several cases in this series with no bad results. Potain's aspirator was used.

Three cases of infected hæmothorax were treated by simple aspiration: 2, by resection of the rib, complete evacuation of the hæmothorax, and closure; and 1, by resection of the rib and Carrel-Dakin treatment. In 5 cases the bullet had traversed the chest but remained lodged in the parietes. The bullets were readily removed. In 2 cases the missile was removed from the lung. In 3 cases the fragment of shell was in the pleural cavity. In 1 case a fragment of shell had passed through the pleural cavity into the liver by way of the diaphragm. After the hæmothorax was removed the edges of the opening in the diaphragm were sutured to the parietes and the track into the liver was packed. Recovery resulted without complications.

When the patient was acutely ill and toxæmic, 2 per cent novocaine was used as the anæsthetic. For the more elaborate operations gas and oxygen proved satisfactory. In 1 case warm ether anæsthesia was used with very good results.

Autogenous vaccines proved beneficial in the cases in which a chronic discharging sinus remained after operation. Breathing exercises were used to promote expansion of the lung.

The author reviews the results of operations performed at casualty clearing stations and divides the operations into two classes: primary, i.e., done soon after the injury was received, and secondary, done after the wound had become septic.

The primary operations were of two types: (1) excision of the wound and suture, and (2) excision of the wound, removal of the fractured portion of the rib, and suture of the pleura and parietes.

Seven cases were treated by the first type of primary operation. Three healed by first intention without complications. Three which were associated with fractured ribs, but in which the rib was not resected became septic and required further operation. All of these patients died. The seventh case, in which a fragment of shell had fractured the ribs and had become lodged, also became septic, but because of the patient's poor condition on arrival no operation was performed and death resulted.

The secondary type of primary operation was done in 9 cases and all but 1 healed by first intention without complications. The 1 case in which primary healing did not occur became infected with streptococci and staphylococci and required further operative treatment at the base hospital.

Secondary operations consisting of resection and drainage were done for infected hæmothorax. Three of the 6 patients so treated recovered.

In the entire series of 82 cases there were 10 deaths (12.2 per cent).

In order to ascertain the end-results of such penetrating wounds of the chest an effort was made to follow the patients after their discharge from the hospital. At the time of their discharge from the hospital the cases were classified as: (1) clean entrance and exit wounds; (2) clean wounds due to lodging bullets; and (3) septic wounds. Fifty per cent of the patients with the first class of injuries were fit for service after two and one-half months' treatment in the hospital. This does not mean, however, that the condition of the chest was normal. The remaining 50 per cent of the patients were convalescent within three months. At the present time a year after the study of these cases, all of the patients are working and are receiving a pension for disability varying from 20 to 30 per cent. Some are still troubled with breathlessness after exertion.

In the second group the hospital period before convalescence was longer. Fifty per cent of these patients who replied to questionnaires were returned as fit for service after an average of three months in the hospital. A year later all of them were at work and were receiving a pension for 40 per cent disability.

In the third group the hospital period was longer than in either of the other two. None of the patients was returned as fit for service, and none of them left the hospital in less than seventy-five days. All of those from whom reports were received a year later were doing light work and were receiving a pension for disability varying from 20 to 40 per cent.

G. W. HOCHREIN.

**Hess, A. F., and Unger, L. J.: Scorbutic Beading of the Ribs.** *Am. J. Dis. Child.*, 1920, xix, 331.

For many years beading of the ribs has been considered characteristic of rickets and in the course of the authors' study extending over a period of two years this sign has been found most valuable in the determination of the degree and kind of this condition. In following the variations in degree their several hundred cases were divided into six grades which changed as the rickets improved or grew worse. The character of the beading was noted—whether it consisted of the usual round, smooth knobby junctures, whether it was angular, or whether there was eversion of the lower free border of the rib. The cause of the greater incidence of the beading in the fifth, sixth, and seventh ribs is not thoroughly understood. Immobilization and excessive mobilization of one-half of the chest made no difference.

The author states that beading is not pathognomonic of rickets as it occurs frequently in scurvy. Demonstrating that beading in scurvy was not due to concurrent rickets is the fact that cases have been observed in which beading was noted in the



absence of other signs of rickets and in which adequate amounts of cod-liver oil had been given, and other cases in which the "rosary" cleared up very quickly following the administration of orange juice or tomato. In doubtful cases also autopsies showed the characteristic signs of scorbutic joints in the costochondral junctures. Scorbutic beading was found in cases of experimental scurvy in animals in which subperiosteal and medullary hæmorrhages were demonstrated. Aschoff and Koch found beading in scorbutic soldiers. Beading may occur also in beri-beri, another so-called "deficiency" disease.

Scurvy was at one time called acute rickets. The basis for this confusion was the fact that beading occurred in what seemed definitely to be scurvy. Therefore beading of the ribs has clinical and diagnostic significance. Rickets and scurvy may be associated but the same deficiency in diet which produces one does not produce the other. It is known that small quantities of fruit juice will prevent scurvy but not rickets and that cod-liver oil will gradually prevent the development of rickets but is of no prophylactic value as regards scurvy.

R. G. PACKARD.

### PHARYNX AND ŒSOPHAGUS

**Mills, R. W., and Kimbrough, J. S.: The Radium Treatment of Cancer of the Œsophagus under Roentgen-Ray Control. *J. Am. M. Ass.*, 1920, lxxiv, 1570.**

Cancer of the œsophagus is one of the most distressing diseases and one in which the situation is hopeless from the standpoint of a radical removal even though the condition gives early symptoms, may be diagnosed at least as early as any other internal cancer, and forms metastases late. Palliative treatment is distressing and unsatisfactory. Therefore the authors deem it advisable to report the results they obtained by radium treatment, even though their number of cases was small and the period of observation at the longest was only eighteen months.

The beneficial action of radium on malignant tissue is due to its selective retrogressive action on the cancer cell when used in a dosage not harmful to normal tissue. When an attempt is made to utilize this principle in the practical therapeutic use of radium, however, certain difficulties are encountered. First, what may be termed the "coefficient of tolerance" of normal as compared with pathologic tissue is not as great as might be hoped for, and second, the devitalizing action of radium on malignant tissue rapidly decreases with the distance of the radium from the tissue, the decrease varying approximately as the square of the distance.

There is as yet no accepted criterion as to the amount of irradiation that the normal œsophagus will tolerate. While at first this would suggest the use of a safe minimum, it must be borne in mind that if benefit is to be derived the dose must be

large enough to be definitely active throughout the entire tumor. Smaller doses, while favorably affecting immediately contiguous malignant tissue, may be so weakened on reaching more distant portions of the growth that they are stimulating rather than inhibiting.

Essential to the successful insertion and continuous application of radium in cancer of the œsophagus are: (1) a knowledge of the location and physical peculiarities of the tumor and the resulting stricture, especially the location, extent, direction, and degree of the stenosis; (2) a means by which effective and non-traumatizing canalization of the cancerous stricture may be effected; (3) a mechanical means of maintaining the radium in direct contact with the tumor; (4) a means by which frequent observation of the position of the radium during the period of treatment is possible; and (5) careful judgment as to the dose, filtration, and frequency of treatment based on experience and the peculiarities of the individual case.

While œsophagoscopy has been utilized to obtain some of these ends, the less appealing roentgen-ray diagnosis of cancer of the œsophagus made in conjunction with the clinical history will probably be as accurate. By this method an initial roentgen-ray study of the position and physical peculiarities of the tumor is made by both screen and plate, a simple mixture of bismuth subcarbonate in water or, when the stricture is not great, bismuth suspended in artificial buttermilk, being used for visualization.

The patient is given a preliminary injection of morphine and atropin one-half hour before the radium treatment is begun. Occasionally, in cases of marked stricture, a spoonful of olive oil one-half hour before treatment is helpful in relaxing secondary spasm. The radium, enclosed in a container composed of German silver 0.5 mm. in thickness and further filtered with 0.5 mm. of brass and a thickness of rubber, is mounted on the end of a slightly springy drawn silver wire encased in a rubber tube. It is introduced like an ordinary œsophageal sound and is left in place for six hours at each initial treatment. In the authors' cases from one to seven treatments were given. The frequency and number of treatments and the length of those after the initial treatment were occasionally varied somewhat to meet the indications of the particular case. In nearly every instance 50 mg. of radium element were used.

The immediate results of the treatment were in most instances beneficial, sometimes greatly relieving the dysphagia. In several, the improvement was almost immediate, being noted within twenty-four hours. A gain in weight occurred in most cases. Curiously, the results were not reflected by a reduction in the local œsophageal deformity and stenosis commensurable with the functional improvement. In several cases slight dysphagia returned but usually was relieved by another treatment.

The tentative results may be summarized as follows: Eleven cases were treated. Cure was not

obtained in any instance but one patient was alive, in good condition and without evidence of metastasis eighteen months after the first treatment and the œsophagus showed no appearance suggesting present carcinoma. The other patients have been under observation less than a year. No case treated could be considered an early case and most of them were frankly advanced. Evidence of metastases was present in only one case and in that instance there was involvement of the stomach as well as of the abdominal œsophagus. Five patients died, one possibly from perforation due to the treatment. In six cases the dysphagia was strikingly improved.

The patients were usually able to continue their work.

The authors' conclusions are:

1. The treatment of cancer of the œsophagus with radium offers hope. In the small series of cases treated a most encouraging feature was the relief of the dysphagia.

2. The roentgen ray gives valuable aid by revealing the peculiarities of the particular lesion and thereby aiding in the insertion and maintenance of the radium in the proper position. It is possible that it would be of value also in other œsophageal instrumentation. G. W. HOCHREIN.

## SURGERY OF THE ABDOMEN

### ABDOMINAL WALL AND PERITONEUM

**Stetten, D.: Modified Technique for the Radical Cure of Inguinal Hernia in the Male. *Ann. Surg.*, 1920, lxxi, 744.**

That so many methods have been and are still being advocated for the repair of inguinal hernia is rather convincing evidence that no one method is as yet quite perfect and that there is still room for improvement.

The modification which Stetten advocates has the Bassini and Halsted operations as its progenitors. Essentially it consists in the overlapping of the external oblique aponeurosis beneath the transplanted cord and over the Bassini suture.

In all cases except those of young children and very nervous adults the operation should be done under local anæsthesia. One-half per cent novocaine with suprarenin is used and injected by a combined conduction-infiltration method along the lines laid down by Braun and Schleich. The usual oblique skin incision is made. It should be sufficiently long so that there is free exposure at the medial angle. Every bleeding point must be carefully clamped and ligated. The external oblique aponeurosis is split in such a way as to leave a liberal lower flap. The cord with the sac is lifted out of its bed. The sac is then bluntly stripped from the cord to the point where the peritoneum begins to spread and is opened in order to determine whether it is empty or not. If necessary, adhesions between the sac and its contents are separated and excessive or diseased omentum is resected. The sac is then ligated or transfixated and ligated as high up as possible and amputated, and the stump is allowed to recede under the muscle. The inguinal branch of the ilioinguinal nerve and the hypogastric branch of the iliohypogastric nerve are retracted so that they will not be included in the suture. The cord is also retracted and the internal oblique muscle with its conjoined tendon is sutured in the usual fashion to Poupart's ligament under the cord. The apposition should be clean, without any interposition of fat. The ring should close snugly about the cord, but

must not be strangulated. The sutures should not be tied too tightly, but the approximation must be accurate.

The next step is the suture of the upper flap of the aponeurosis of the external oblique muscle to Poupart's ligament also beneath the cord, just over the previous suture line. It may be done with interrupted sutures or with two short continuous sutures. The aponeurosis should be sutured laterally and medially to the exit of the cord, a sufficient space being left at its point of emergence to prevent strangulation. Medial to the ring the suture should be extended to the spine of the pubis.

The lower flap of the aponeurosis of the external oblique is then split perpendicularly to its fiber at a point opposite the ring with a straight, double, blunt-pointed scissors. This division is extended directly up to Poupart's ligament, but not into it, and the cord is guarded with a blunt instrument to keep it from being nicked. In this way the lower flap is divided into two portions, a smaller and lateral portion and a larger portion which is medial to the point of exit of the cord. This sectioning is necessary to prevent angulation of the cord when the lower flap is overlapped on the upper flap beneath the cord. The smaller lateral portion of the lower flap is now overlapped on the already sutured upper flap of the aponeurosis and held in place with several interrupted sutures or a short continuous suture. The larger, medial portion of the lower flap is then passed beneath the cord and sewed on the upper flap of the aponeurosis in a similar manner, the suture extending as near to the pubic spine as possible. A stitch is taken at each point where the lower flap has been divided and lies on the upper flap of the aponeurosis. The angles of the lateral and medial flaps should approach each other as closely as possible without constricting the cord. In some cases they may be approximated or even overlapped. The cord is left beneath the skin.

The advantages of the proposed method are:

1. The hernial orifice is closed by a triple layer of tissue and all available material is used for the plastic repair. The typical Bassini suture of the



internal oblique muscle and conjoined tendon to Poupart's ligament is reinforced by a double suture line overlapping with broad apposing surfaces the aponeurosis of the external oblique beneath the cord. It is conceivable that if one or even two of the suture lines gave way, the third would be sufficient to prevent a recurrence.

2. The danger of kinking and strangulation of the cord is reduced to a minimum as the cord emerges perpendicularly through the abdominal wall.

3. If oozing from the cord occurs the hæmatoma which might form would be merely under the skin instead of beneath the muscles or aponeuroses.

The author has operated upon 200 cases by this method and no recurrence has been reported in those which he has been able to follow up.

Inguinal hernia in the female may be treated by a similar procedure in which a triple suture line is made and the aponeurosis is overlapped, but the splitting of the lower flap is rendered unnecessary by the absence of the cord. The round ligament is fixed by including it in one or two of the sutures between the internal oblique muscle and conjoined tendon and Poupart's ligament.

As suture material the author uses No. 2 or No. 3 chromicized catgut for the deep internal oblique muscle and conjoined tendon, and No. 1 or No. 2 chromicized catgut for the aponeuroses. In operations on children the finer material is preferred.

In recurrent cases or cases of large herniæ in which there has been considerable oozing a small split-rubber tube drain should be placed subcutaneously at the lower angle of the incision to relieve the serous accumulation which is apt to be formed. This drain may be removed after a few days. The skin should be sutured with interrupted silkworm gut.

The dressing should be a double spica. In its application the scrotum should be exposed so that the condition of the testicles can be observed. To prevent undue congestion of the testicles the scrotum should lie on an adhesive plaster bridge. The average patient may be allowed up in from ten to twelve days after the operation. Heavy work should not be permitted for at least six weeks, and under no circumstances should a truss be applied.

G. W. HOCHREIN.

**Schley, W. S.: The Utilization of the External Oblique Aponeurosis in Inguinal Hernia with Muscle Deficiency.** *Ann. Surg.*, 1920, lxxi, 753.

Schley urges additional fortification of the inner half of the inguinal canal in cases of hernia in which the muscular structure (the so-called conjoined tendon) and especially the internal oblique muscle is weak, attenuated, or deficient. He believes that the problem of hernial repair would be greatly simplified if surgeons availed themselves of the anatomical resources of this region.

The procedure used by the author is not complicated and consumes only ten or fifteen minutes

more than the regular Bassini method. It consists of the suture of the inner half of the external oblique aponeurosis to Poupart's ligament after the internal oblique and conjoined tendon have been sutured and the overlapping of the internal half by the external half.

This method has been found of value both in cases of moderate muscular deficiency of the internal half of the inguinal canal and in cases in which additional procedures such as rectus transposition were necessary.

Transplantation of the cord Schley considers an essential part of the operation for hernia. When it is not done, an opening is left at the weak inner angle and atrophy of the testicle may result from excision of the cord veins. The whole inguinal canal should be obliterated by apposition of the muscle to Poupart's ligament.

The patient's position after operation is of importance. Moderate elevation of the trunk and thighs, which is easily obtained with the Gatch bed, relaxes both rectus and aponeurotic tension and not only makes the patient more comfortable but gives physiological rest.

G. W. HOCHREIN.

**Hughes, B.: Acute Diffuse Peritonitis.** *J. Roy. Army Med. Corps*, Lond., 1920, xxxiv, 521.

Peritonitis is due to the entrance of virulent infection of intestinal origin into the peritoneal cavity and may be the result of trauma or disease.

There is first hyperæmia of, and exudation into, the infected focus. Then follows exudation into the peritoneal cavity of a fluid which rapidly becomes turbid. This fluid is protective in character and in the beginning is sterile.

After an injury peristalsis ceases, the gut becomes immobile, and adhesions begin to form. Adhesions are protective and the formation of many plastic adhesions is therefore a good sign. In the next stage the fluid is slowly converted into pus. At this time treatment may result in complete resolution. If the protective fluid becomes pus it causes septic absorption which leads to death from toxæmia. Peristalsis is an important factor in the dissemination of septic material throughout the peritoneal cavity.

The symptoms are merely the body's method of coping with the disease. The rigid abdominal muscles form a splint; pain and tenderness promote quiet; adhesions of the gut and omentum are attempts to wall off the infection; and vomiting is a natural method of getting rid of toxins. The most important complications of peritonitis are toxæmia, localized abscess, and obstruction.

The usual treatment of the condition consists of: (1) the removal of the cause at the earliest possible moment; (2) drainage of the cavity with or without lavage; (3) abolition of distention by artificial means such as calomel, enemata, etc.; (4) the control of vomiting by drugs or lavage; (5) the administration of stimulants and salines, either rectally or subcutaneously; and (6) suitable nourishment.

The author's conclusions with regard to treatment are as follows:

1. The operation should be performed with the least possible disturbance of the gut and peritoneum.

2. A small tube or glove drain may be left in the wound for forty-eight hours but is not always necessary. If left in for a longer period adhesions will form around it. As the early fluid lymph and adhesions are protective in character they should not be disturbed. If pus forms, drainage may be instituted. The peritoneal pouches should be carefully mopped out with dry sterile swabs. Lavage is useless for this purpose as it washes away the protective fluid and spreads the infection.

3. The inflamed gut should be splinted. One-fourth grain of morphine should be given every eight hours, and 1/100 gr. of atropine every twelve hours. When the pupils begin to contract (usually in forty-eight hours), the dose of morphine should be reduced to 1/4 gr. given every twelve hours. These drugs are continued until vomiting ceases and flatus is passed, which usually occurs on the fourth or fifth day. As the intestine is inflamed, rest is indicated as in cases of cellulitis of the leg or other inflammations.

4. Vomiting should be encouraged as it is a means of getting rid of toxæmia. The character of the vomitus gives a clue to the nature of the prognosis. Gradually clearing biliary vomitus is a good sign, coffee-ground vomitus denotes a more serious toxæmia, while faecal vomitus indicates further obstruction and calls for operation.

5. Normal saline solution is best administered subcutaneously and is necessary to prevent dehydration from vomiting. Nine or ten pints should be given every twenty-four hours for the first two days, the amount being then reduced to 5 pt. The administration of the solution should be continued until vomiting has ceased. Copious drinks of water containing sodium bicarbonate and sodium citrate are necessary to wash out the stomach and promote diuresis. In forty-eight hours the patient will begin to pass large quantities of urine and will feel better. Stimulants are contra-indicated. When vomiting ceases, bismuth and compound tincture of camphor are beneficial.

6. No nourishment should be given for the first forty-eight hours. On the third or fourth day glucose may be administered by rectum. As soon as vomiting has ceased Brand's essence and albumin water sweetened with glucose may be given in small quantities frequently and regularly; also as much water as desired. After a week, milk and soda water, raw eggs, and a little custard may be allowed and the diet gradually increased, but a full diet is contra-indicated. On the tenth or twelfth day castor oil may be prescribed.

One of 21 consecutive cases treated by the author in this manner is cited as typical. In the 21 cases the cause of the peritonitis was abscess of the appendix in 6; perforated gastric ulcer in 1; penetrating wound of the abdomen in 8; intestinal obstruction with

perforation of the gut in 4; and pneumococcal infection in 2.

There was 1 death, that of a patient with intestinal obstruction and gangrene of the gut. Recovery resulted in 20 cases.

M. H. HOBART.

**Seelig, M. G.: Pseudomyxoma Peritonei in Male Subjects. *Surg., Gynec. & Obst.*, 1920, xxx, 570.**

While there is a sufficiently large number of recorded cases of pseudomyxoma peritonei to remove this disease from the category of rarities, the number of studied cases is too small to furnish a satisfactory concept of the exact nature of the pathologic process.

The outstanding and characterizing feature of the disease is the accumulation in the peritoneal cavity of a colloid exudate varying in consistency from a syrup to solid colloid masses. This exudate is the only constant finding in the disease. In some instances there is a progressive cachexia leading to death; in others, the disease runs a benign course followed by perfect recovery after suitable operative treatment, and often, doubtless, without operation. In a large majority of cases the primary cause of the disease is a rupture of a pseudomucinous ovarian cyst, while in a by no means small minority of cases this factor is the rupture of a mucocele of the appendix. To date, the latter is the only cause found responsible for the disease as it occurs in males.

Seelig's experience is limited to two cases, one of which is reported in detail in this article. The patient was a white male, 42 years old, who entered the hospital complaining of abdominal pain, abdominal distention, weakness, and loss of weight. The pain had begun two years previously. At this time there were no gastric symptoms. The condition continued without variation for six months, when, after a fishing trip, the patient returned home with a more or less severe cramp-like pain in the lower left abdomen which persisted all day. A physician prescribed some tablets and a physic. Five months after this attack the patient noticed that his abdomen had begun to enlarge while the rest of his body was becoming thinner. He was told he had dropsy and that tapping would be necessary.

In October, 1912, he was operated upon and it is presumed that some fluid was removed. On inquiry it was learned that the surgeon had diagnosed the case as appendicitis and had operated on that basis. The patient stated that the wound was slow to heal and the dressings were saturated with a clear yellow fluid which resembled urine. This discharge continued for a week. He left the hospital in three weeks, but was not strong and the wound continued to discharge. He came under the author's care in December, 1912.

At this time a positive Wassermann reaction was obtained. The author's diagnosis was syphilis malignancy (?), pseudomyxoma peritonei (?). The patient was put on dietetic treatment to increase his resistance and the sinus was regularly dressed with an aseptic dry dressing. Within a week



antisyphilitic treatment was instituted. At the end of a month the general condition was improved but there was no marked change in the local condition. Salvarsan was then injected intravenously, with the result that the discharge became more profuse for a few days but after a week the abdomen became considerably smaller, the discharge became less, and there was improvement in the general condition. This improvement, however, did not last long. At the beginning of the third month of treatment both legs became oedematous and finally skin excoriations were discovered. The discharge from the sinus grew more profuse. The patient became progressively weaker and died of exhaustion February 23, 1913.

An autopsy was performed. The anatomical diagnosis was pseudomyxoma peritonei; chronic peritonitis, with purulent and faecal exudate in the abdomen; brown atrophy of the heart; early arteriosclerosis of the aorta; and oedema of the lungs.

The pathology of pseudomyxoma peritonei is very striking and as far as the author knows it is unique in that the disease may run a benign or a malignant course clinically without furnishing any macroscopic or microscopic differentiating criteria. The outstanding pathologic feature of the disease, the accumulation of a gelatinous material, has been shown to be pseudomucin. This material may be found circumscribed in the right iliac fossa or may be widely scattered throughout the peritoneal cavity. Kaufmann, who refers to the disease as "pseudomyxoma peritonei ex appendice", classifies the possible sources of the pseudomucin as: (1) rupture of a cystic appendix; (2) rupture of a diverticulum of the appendix; and (3) perforation of an acutely inflamed appendix.

The course of events following the escape of the pseudomucin varies:

1. The exudate may be limited in its escape to the right iliac fossa where it constitutes itself as a saucer-like, kidney-like, or sausage-like mass which is slowly encapsulated by connective tissue growth.

2. It may not be localized to the right iliac fossa, but may escape to various and multiple intraperitoneal sites, setting up the typical peritoneal productive reaction which results in loculation of the pseudomucin into cyst-like cavities to which neighboring peritonealized structures become adherent. Sometimes in this form of spread the pseudomucin becomes delicately encapsulated and hangs from the intestinal peritoneum like small polypi.

3. It may be entirely absorbed. At the time this paper was written Seelig had under observation a case in which it seemed probable that a pseudomyxomatous mass was undergoing absorption.

4. It may become widely disseminated and possess a tendency to marked secreting activity. It is such cases which present clinically the appearance of an ascitic abdomen with the associated symptoms of cachexia and general physical deterioration. In this group there may be infiltration of the abdominal wall. In spite of all the signs of malignancy, there is

in some instances clear-cut clinical evidence of the benign nature of the condition, while in other recorded cases this type of the disease has been as fatal as widespread intra-abdominal carcinosis. Kinking of the intestine with consequent intestinal obstruction is naturally a probable complication.

From the histopathologic point of view the chief interest centers around the fate of the epithelial cells which usually spread with the exudate. According to Cagnetto, the contents of a cystic appendix are made up of mucus, leucocytes, and epithelial cells. The epithelial cells are usually found lining the various cyst cavities and vary in size from low cuboidal to high cylindrical cells. It is quite generally conceded that as the pseudomucinous exudate accumulates within the newly formed connective tissue capsule the intracapsular pressure destroys the epithelial lining. If this assumption is correct, it introduces an element of confusion in establishing definite criteria by which a diagnosis of carcinoma may be established.

The symptoms of the disease vary within broad limits according to the stage to which it has progressed and the type of pathologic course it follows. In Seelig's second case, the case reported in this article, he was able to make the diagnosis tentatively because of the facts that the patient's appendix had been removed at an earlier date because of appendicular disease, a postoperative fistula had been formed, and from this fistula a thin, mucinous exudate exuded.

The prognosis of the disease varies from excellent to hopeless. If operative interference is instituted early before wide dissemination has occurred, a cure may usually be expected. The widely disseminated types (irrespective of whether subsequent investigation classes this type as pseudomyxoma or as carcinoma) offer the most hopeless outlook.

Treatment consists in removing the primary focus of the disease—the appendix—and scooping out that portion of the exudate which can be reached conveniently and with safety, no attempt being made to clear the abdominal cavity of its entire pseudomucinous content. G. W. HOCHREIN.

## GASTRO-INTESTINAL TRACT

Warren, R.: *The Surgery of Gastric Urgencies. Practitioner*, 1920, civ, 429.

This article refers to only two classes of gastric urgency: (1) perforation of gastroduodenal ulcer, and (2) hæmorrhage from gastroduodenal ulcer. On the basis of the statistics of 72 unselected cases of perforated ulcers the author has arrived at the following conclusions:

1. Thirty-five per cent of the ulcers were of gastric origin, and 52 per cent of duodenal origin. The origin of the remainder, which were situated in the pyloric region, is doubtful. There is no relationship between the mortality due to ulcer and the location of the lesion.

2. Early operation is of great importance. The prognosis is good in cases of twelve hours' duration, but poor in those of twenty-four hours' duration.

3. The length of time required to perform the operation is an important factor. The mortality will decrease as the time consumed by the operation is lessened.

4. Gastro-enterostomy should be done after the ulcer has been occluded and invaginated. The mortality was 60 per cent when simple suture and invagination of the ulcer were done and only 28 per cent when the simple suture was followed by gastro-enterostomy. This is probably due to the fact that when gastro-enterostomy has been done the acidity is reduced and the patient may be given food earlier.

5. Jejunostomy in very severe cases gave poor results as most of these cases were hopeless when the operation was performed.

In his discussion of 12 cases of hæmatemesis from duodenal and gastric ulcers which have come under his care the author states that many cases are treated expectantly with disastrous results.

Surgical interference is urgent in all of these cases. The blood supply of the ulcer should be cut off at its source by ligatures and three or four stout catgut sutures drawn tightly around the ulcer transversely to its base. The operation should then be completed with a posterior gastro-enterostomy.

H. K. BEGG

**Straus, D. C.: Perforated Gastric Ulcer—Diagnosis, Surgical Management, Treatment by Actual Cautery.** *Surg. Clin. Chicago*, 1920, iv, 493.

Two cases of perforated gastric ulcer were presented in this clinic. The clinical and anatomical findings had been different in each and accordingly each had received different treatment.

The first patient when seen previously by another physician complained of epigastric pain, nausea, and vomiting. His appearance, marked tenderness in the epigastrium, and a typical gastric ulcer history led the physician to send him to the hospital at once. On admission to the hospital he was examined and found to be in about the same condition as on the previous day. Sixteen hours after admission he complained of severe colicky pains in the abdomen. His lips were slightly cyanotic and there was marked rigidity over the entire upper abdomen, but no definite point of tenderness. The blood count was 22,000. A diagnosis of perforated gastric ulcer was made.

When the abdomen was opened a large perforation was found and the abdominal cavity was discovered to be filled with stomach contents. A stomach tube was passed and the remaining contents were aspirated. The perforation was then closed with through-and-through silk sutures reinforced by a row of Lambert sutures. A suprapubic tube was inserted and the abdominal cavity washed out with saline solution. Drainage of the upper abdomen was effected by means of a rubber tube and a Bullet drain.

In the second case at the time of admission to the hospital a typical picture of perforated gastric ulcer was presented. At operation, which was performed at once, a small pin-point perforation was discovered. The edge of the ulcer had not sloughed away and therefore was removed with the actual cautery and the opening closed as in the first case. As little or no food had escaped into the abdominal cavity, only a small drain was required and no irrigation was necessary.

The important points brought out in the discussion of these two cases before the clinic may be summarized as follows:

1. The history should always be taken carefully in order to elicit every point which might indicate a previous gastric ulcer.

2. There are no symptoms characteristic of threatening perforation.

3. In early cases the diagnosis is usually easy. The history, a moderate degree of shock, agonizing epigastric pain, nausea, vomiting, and marked rigidity are the striking factors.

4. When the patient reaches the quiescent stage two or three hours after perforation the serious nature of the case must not be overlooked. A careful history and leucocyte count will aid in the diagnosis.

5. When peritonitis has set in it must not be mistaken for acute appendicitis, perforated gall-bladder, or pancreatitis.

6. When the indurated edge of the ulcer has not sloughed away it is best to remove it with the actual cautery. This procedure not only sterilizes the area but also guards against the development of carcinoma.

7. Gastro-enterostomy is not indicated unless pyloric obstruction following the operative procedure is feared.

8. Simple drainage is sufficient unless there are large quantities of gross food particles in the abdominal cavity, in which case it is advisable to irrigate with a saline solution and drain suprapubically.

Both of these patients are doing very well at the present time and have no symptoms of their previous trouble.

H. K. BEGG.

**Smithies, F.: The Significance of Etiological Factors in the Treatment of Peptic Ulcer.** *J. Am. M. Ass.*, 1920, lxxiv, 1555.

The author's study has carried him away from the ancient, unproved, and still prevalent conception of peptic ulcer as a local gastric disease caused by so-called "acid corrosion" and has led him to regard the gastric lesion as merely the local, accidental manifestation of a systemic disturbance initiated by a great variety of agents and seldom caused primarily by a gastric upset.

Only 53 per cent of patients with gastric ailments previously diagnosed as ulcer were found after thorough study to have that condition. A review of the gastric chemism in 2,168 definitely proved cases of ulcer revealed the fact that 56 (2.6 per cent)



showed no free HCl; 499 (23 per cent) had free HCl values below 30; 890 (41 per cent) had free HCl values within the normal range of 40 to 50 (Toepfer); and 723 (33.4 per cent) showed more than the "normal" free HCl.

The author is convinced that careful search for precise etiological factors in cases of ulcer will disclose information of value in the establishment of an intelligent therapeutic regimen. Local treatment will be permanently successful only when it is co-ordinated with therapeutic measures tending to restore to normal the systemic disturbance of which the gastric defect is but a part.

An ulcer classification is presented which is based on what the author considers valuable etiological facts. The following groups, with the number of cases found in a careful analysis of 522 proved cases of gastric ulcer, are presented: (1) infections, chronic and acute, 173 cases (33.1 per cent); (2) arteriosclerosis, 77 cases (14.7 per cent); (3) visceral hypertonia, 68 cases (13 per cent); (4) chronic anæmia, 61 cases (11.3 per cent); (5) syphilis, 41 cases (7.8 per cent); (6) visceral hypotonia, 27 cases (5.2 per cent); (7) postoperative influence, 27 cases (5.2 per cent); (8) industrial intoxication, 22 cases (4.2 per cent); (9) metabolic dysfunction, 18 cases (3.4 per cent); and (10) trauma, 8 cases (1.5 per cent).

W. H. NADLER.

**Paterson, H. J., and others: Discussion on the Remote Results of the Surgical Treatment of Gastric and Duodenal Ulcers.** *Proc. Roy. Soc. Med., Lond.*, 1920, xiii, Sect. Surg., 141.

The remote results of gastro-enterostomy in the treatment of gastric and duodenal ulcers may be considered in three divisions, that is, clinical, physiological, and pathological.

Of the author's 450 patients, 80 per cent may be regarded as cured; 9 per cent as relieved; and 7 per cent as unrelieved. In 4 cases a jejunal ulcer developed and in 1 there was a recurrence of duodenal ulcer. In 23 cases the operation was a complete failure. Before the performance of gastro-enterostomy there must be a definite pathologic indication or failure is insured.

Of the physiological effects, diminution of the total acidity and increase of the mineral chlorides in the gastric contents are constant. The former is due to a decrease in the amount of total chlorides secreted by the gastric mucosa and a neutralization of the free hydrochloric acid by bile and pancreatic juice which enter the stomach through the anastomosis. The increase of the mineral chlorides is due to the chlorides added by bile and pancreatic juice. After a gastro-enterostomy is undone these elements rapidly return to their normal values. Furthering this hypothesis is the fact that no increase is found in cases in which an entero-anastomosis or Y-operation has been performed. The different types of gastro-enterostomies, with the exceptions noted, yield no differences in this estimation. It must be concluded, therefore, that

the operation affords relief on physiological rather than mechanical grounds.

Postmortem examinations of 5 persons four or five years after an anterior gastro-enterostomy indicated the remarkable adaptation of nature to new conditions. The anterior surface of the stomach was drawn downward and posteriorly, while the proximal or afferent loop was shortened to half its original length. In 16 examinations the ulcer, gastric or duodenal, was found to have healed after gastro-enterostomy. The anastomotic opening had narrowed approximately  $\frac{1}{2}$  in.

Jejunal ulcer is the most serious complication. A clear distinction should be made between jejunal and gastrojejunal ulcers. The latter term should be applied to ulcers which occur along the line of anastomosis. The incidence of jejunal and gastrojejunal ulcer is between 1 and 2 per cent.

These ulcers are associated either with hyperacidity and hypersecretion of the gastric juice or with diminished flow or diversion of bile. Few jejunal and gastrojejunal ulcers are caused by other toxic agents and infective processes. If such is their etiology the ulcers generally are multiple. Usually they result from the action of hydrochloric acid in increased amount or concentration. The time interval and location of the ulcers are the basis of objections to the theory that trauma from clamps is an exciting factor. Non-absorbable suture material is probably not a cause of gastrojejunal ulcer.

Entero-anastomosis and operations of the Y-type expose the jejunum to the action of gastric juice unmingled with bile and pancreatic juice and are a fruitful source of jejunal and gastrojejunal ulcers.

It must not be forgotten that gastro-enterostomy is but an incident in the treatment of gastric and duodenal ulcer. A carefully regulated diet after operation is all-important. When the operation is performed in the presence of definite pathology it is as satisfactory as any major surgical operation. The failures do not exceed 7 per cent.

P. C. GUNBY.

**Seidl, F.: The Use of the Soft Duodenal Sound for Examining the Gastric and Duodenal Secretion for Occult Bleeding in Gastric and Duodenal Ulcer** (Ueber die Anwendung der weichen Duodenalsonde zur Untersuchung des Magen- und Duodenalsaftes auf okkulte Blutung bei Ulcus ventriculi und Ulcus duodeni). *Arch. f. Verdauungskr.*, 1920, xxvi, 19.

Seidl examined 70 patients with Einhorn's soft duodenal sound. He reports the results of 26 cases in which a triple stool examination after short intervals either showed no occult bleeding or, because of hæmorrhoids, was of no value. The benzidine test was employed.

The sound is better than the stomach tube in that it is less apt to cause injury to the mucosa of the throat or stomach. By sounding with the patient in the left position and then in the right position and by examination of the duodenal

contents some idea regarding the location of the ulcer may be obtained. Repeated examinations reveal the effectiveness of an ulcer therapy and the indications for operation. A further advantage in the use of the sound lies in the fact that the demonstration of occult blood is possible without placing the patient on a meat-free diet. In addition, the procedure is not very disagreeable to the patient.

KOERBL (Z).

**Pauchet, V.: The Surgical Treatment of Cancer of the Stomach** (Traitement chirurgical du cancer de l'estomac). *J. de chir.*, 1920, xvi, 129.

Pauchet considers gastrectomy the operation of choice for the treatment of gastric cancer. He never does a jejunostomy and is of the opinion that gastro-enterostomy is indicated only as the first stage of a gastrectomy. He avoids the use of both ether and chloroform as anæsthetics.

The technique of the gastrectomy performed by Pauchet is based on that of Hartmann and Cuneo. The transverse mesocolon is perforated at its most avascular point and a jejunal loop taken about 10 or 15 cm. from the duodenojejunal angle, is drawn through this opening. The anastomosis is then made by means of a button, end-to-side suture, end-to-side implantation, or suture and a side-to-side button jejunostomy. The operation is generally performed in one stage but in cases of tight pyloric stenosis it is done in two stages. When the patient is dehydrated or has acidosis the mortality of the one-stage operation is 40 per cent while that of the two-stage operation is only 10 per cent. In the first stage of the two-stage gastrectomy a posterior transmesocolic gastro-enterostomy is done under local anæsthesia with the use of a Jaboulay button. The second stage consists of the resection and is done from ten to twenty days after the first stage.

Pauchet has performed about 300 gastrectomies for cancer. In these cases the operative mortality varied from 12 to 20 per cent according to the time at which the operation was done. The author's experience of twenty years has convinced him that the immediate and end-results of gastrectomy for cancer of the stomach are much better than is commonly supposed.

W. A. BRENNAN.

**Watkins, J. G.: A Successful Case of Lateral Intestinal Anastomosis through the Vagina.** *Lancet*, 1920, cxcviii, 1364.

The author reports a case to illustrate a useful emergency operation. A therapeutic abortion was being done on a multipara who two years before had undergone a ventrofixation of the uterus. The dilatation of the cervix was easily accomplished, very little force being necessary. The placenta and the body of the fetus were extracted together with several pieces of fat. In reaching for the head, the operator drew down a tough, flat, shiny substance which was thought to be a portion of the neck. After considerable trauma to this tissue it was discovered to be a coil of empty intestine which had

been torn from its mesentery. On exploration of the uterine cavity a 2-in. tear was found on the left wall. As the patient's condition made it impractical to perform a laparotomy, a partial resection and a lateral anastomosis of the intestine were done through the vagina. The intestine was returned to the abdominal cavity and a gauze drain inserted through the uterine laceration.

For several weeks following the operation the patient had moderate abdominal pain and a slightly increased bodily temperature. During the third week feces were passed through the vagina and several portions of the foetal skull were removed from the uterus. Two months later the patient's general condition was good, the fecal fistula had closed, and the bowels were moving without catharsis.

The author advises digital exploration of the uterus to rule out lacerations. A cervix that dilates too readily should be regarded with suspicion and the operator should beware of anything in the uterus that is not obviously foetal or placental tissue.

A. J. SCHOLL, JR.

**Novaro, N.: Subcutaneous Intestinal Rupture Caused by Direct Trauma in a Case of Irreducible Inguinal Hernia** (Rottura intestinale sottocutanea da trauma diretto in ernia inguinale irriducibile). *Policlin.*, Roma, 1920, xxvii, sez. chir., 113.

Cases of traumatic rupture of the intestine in the sac of an inguinal hernia have rarely been reported in the literature. In this article Novaro reports the case of a man 67 years of age who had had a right inguinal hernia for about twenty-five years and who, in falling, received a blow directly above it. Despite the sudden, intense inguinal pain he was able to walk about 400 yd. to his home. He did not enter the hospital until two days later. The condition was then diagnosed as a partly irreducible inguinal hernia on the right side, traumatic rupture of the intestinal loop herniated in the sac, and acute diffuse peritonitis.

An operation was performed immediately, about fifty hours after the injury. The inguinal sac was exposed and found to contain a portion of the omentum and small intestine. The latter was twisted, adherent by fibrin-pus, and lacerated at a point corresponding to the in-curving of the loop toward the inferior pole of its scrotal lodgment. There was no other rupture and no evidence of strangulation. A black foetid fluid was found in the abdominal cavity and between the herniated intestinal loops and the walls of the hernial sac. The intestine was reduced into the abdomen after repair of the rupture and an attempt was made to check the infection by drainage. Death occurred after a few days from acute peritonitis.

The author believes that the lesions in this case were caused by two different mechanisms. First, the involuntary instinctive movements made by the patient during his fall produced a sudden contraction



of the abdominal muscles which caused an immediate and decided increase in the intra-abdominal pressure. This pressure then overcame that of a truss and allowed the sudden ingress into the hernial sac of the omentum and a loop of the intestine with its gaseous and fluid contents, the sac being filled beyond its ordinary capacity. The rupture of the intestine in the sac was due therefore to a contusive-compressive mechanism which did not prevent the sac from emptying its contents into the abdominal cavity. The distention of the loop was naturally toward the scrotal pole where it found least resistance.

Exact diagnosis of lesions produced by direct trauma in the inguinal region is not easy and the literature contains only a few cases in which such a diagnosis was made. Early diagnosis is of the greatest importance, however, as nearly all patients who were operated on later than twenty-four hours after the injury have died. The best treatment is prompt and rapid surgical operation, all attempts to reduce the hernia being avoided. The procedure should consist of a herniolaparotomy as ample as possible to give exit to the septic contents of the abdominal cavity and drainage of the cavity. In cases of rupture of a herniated intestinal loop any delay in surgical exploration is almost certainly fatal.

W. A. BRENNAN.

**Bolton, C., and Trotter, W.: Clinical Observations on Jejunocolic Fistula following Gastrojejunostomy.** *Brit. M. J.*, 1920, 1, 757.

The authors review 31 cases of jejunocolic fistula following gastrojejunostomy, 27 of which were collected from the literature.

Symptoms of jejunal ulcer, such as pain, vomiting, and bleeding, may precede those of fistula, or a symptomless fistula may be found during an operation for the relief of recurrent ulcer pains.

The fistula, which may develop as early as a few weeks and as late as nine years after a gastro-enterostomy, generally manifests itself by a sudden and profuse attack of faecal vomiting and diarrhoea. The diarrhoea occurs in attacks which alternate with periods of normal movements. Vomiting generally occurs with the diarrhoea, but may be absent, occasional, or induced for relief. The vomitus may resemble waste passed by bowel and have a typical colonic odor or it may have merely a sour odor and contain bile and pancreatic ferments. Repeated examinations of the vomitus are occasionally necessary to establish the diagnosis as in some cases the leak is intermittent. The eructation of foul-smelling gas is quite common. The pain, which is cramp-like and due to intestinal colic, may be relieved when the diarrhoea appears. The appetite is lost in most cases, but in a number of those reviewed it was normal or even increased.

Physical examination may show abdominal distention or increased peristalsis; occasionally a tumefaction may be felt surrounding the ulceration.

In a few cases an X-ray examination of the stomach gave definite evidence of the disease, but

in the majority of cases the findings were inconclusive.

Several aids in the diagnosis are the following: substances given by mouth may shortly afterward be recognized in the faeces; material injected into the rectum may be recovered by gastric lavage; the stomach is distended by the passage of air into the rectum, and vice versa.

The fistula connects the jejunum and the transverse colon and is often situated below and quite close to the gastro-enterostomy opening. The stomach may also communicate with the colon, allowing the gastric contents to empty directly into the large bowel and producing a lenteric type of diarrhoea.

In most cases there is regurgitation of the contents of the colon into the jejunum with a minimal passage only of the jejunal contents into the colon. The edges of the fistula may be healed and smooth and the gastro-enterostomy opening may be closed.

The patient's nutrition is often quite well maintained for a time, but wasting and inanition generally supervene gradually.

The hydrochloric acid of the gastric contents is an important factor in the formation of jejunocolic fistula. The amount of gastric juice should be controlled after gastro-enterostomy in order to prevent fistulous complications.

The treatment of jejunocolic fistula is surgical; the most satisfactory procedure is obliteration of the fistula without interference with the gastro-enterostomy. To secure a proper closure it is necessary to separate the jejunum and colon. If this is not possible, excision of the gastro-enterostomy may be necessary. A temporary cæcostomy which prevents the accumulation of gas above the suture line is often of great value.

Four of the 31 patients were not operated on and died. Six of the 27 patients operated on died; in 2 of these cases an exploration was done, but the fistula was not touched.

A. J. SCHOLL, JR.

**Slesinger, E. G.: Actinomycosis of the Cæcum, with Notes of an Unusual Case.** *Lancet*, 1920, cxcviii, 1220.

It has been said that in 60 per cent of the cases abdominal actinomycosis occurs in the appendicocæcal region. There are two theories as to the methods of infection, the first, that some infected foreign body lodges in the mucosa of the intestine, thereby carrying the infection to the connective tissue (in which tissue only it is pathologic), and the second, that the actinomyces are normal inhabitants of the intestinal tract and that a foreign body causes a trauma which becomes the point of entrance for the infection into the connective tissue of the gut wall. It is an open question whether the appendix or the cæcum is the point of primary infection.

There are three types of actinomycotic infection of the appendicocæcal region. In the first and the most common form a painless and progressively enlarging tumor develops in the right iliac fossa

with the ultimate formation of abscesses and fistulae. The second type is more acute in onset and simulates an ordinary attack of appendicitis of fair severity; the appendix is usually found to be gangrenous at its base. The third and most rare form consists of a class of cases in which an infected patch occurs in the cæcum and perforates, giving rise to a secondary generalized peritonitis.

The case reported is of the third type. A woman, 32 years of age with a history of recurrent attacks of pain in the right iliac fossa for a period of two years was admitted to Guy's hospital for severe generalized abdominal pain, worst in the right iliac fossa. A diagnosis of acute appendicitis was made and immediate operation was performed. When the abdominal cavity was opened a large amount of purulent material was found in the pelvis. The cæcum presented a thickened patch with a perforation in its center. Films of scrapings from the margins of this patch and from the purulent material from the pelvis revealed the presence of actinomycetes. The normal appendix was removed and the cæcal patch with its subsequent invagination was scraped. The peritoneal cavity was irrigated with saline solution by means of Carrel tubes, these tubes being removed at the end of the third day. Fifty grains of potassium iodide were given three times a day. The wound healed readily and three months after the operation the patient seemed to have entirely recovered.

B. R. PARKER.

**Aimes, A.: Intestinal Occlusion in the Course of Tuberculous Peritonitis** (L'occlusion intestinale au cours de la péritonite tuberculeuse). *Rev. de chir., Par.*, 1920, lviii, 177.

The author has been able to find in the literature the reports of only 64 cases of intestinal occlusion occurring in the course of tuberculous peritonitis. His article is based on a review of these cases and a case of his own.

Intestinal occlusion may occur in the course of a known or a latent peritoneal tuberculosis or after peritonitis has been cured.

Generally tuberculous peritonitis is unrecognized and occlusion is the first symptom. The occlusion may be chronic or acute. Chronic occlusion has been considered the most frequent type but has been observed in only 22 cases, while acute occlusion was present in 42 cases.

As a rule the occlusion is brought about by stricturing bands. In the 64 cases reviewed it was due to this cause in 22, to adhesions of the intestinal loops in 15, and to paralysis in 13.

The prognosis is grave if an operation is not performed. In the series of cases reported there were 4 deaths in the 4 cases not treated surgically. In 21 cases treated by simple laparotomy there were 14 recoveries and 7 deaths; in 15 cases in which bands were sectioned there were 11 recoveries and 4 deaths; in 7 cases in which adhering intestinal loops were separated there were 4 recoveries and 3 deaths; in 5 cases in which an artificial anus was formed there

were 3 recoveries and 2 deaths; and in 12 cases in which other operative procedures were used there were 6 recoveries and 6 deaths. Subsequently 7 patients died from peritoneal or pulmonary tuberculosis.

In intestinal occlusion due to peritoneal tuberculosis operative manœuvres should be reduced to the minimum. Statistics show that 64 per cent of the cases of paralytic occlusion are cured by operation. In occlusion due to bands the mortality is only 21 per cent while in that due to adhesions it is 55 per cent.

The peritoneum is very tolerant in tuberculous peritonitis and by a laparotomy both the occlusion and the peritonitis may be treated. The formation of an artificial anus is necessary only if the patient's condition is very poor or if, after the abdomen is opened, it is evident that nothing else can be done to overcome the occlusion.

W. A. BRENNAN.

**Flint, E. R.: Acute Appendicitis; A Study of 370 Cases.** *Practitioner*, 1920, civ, 352.

Flint's paper is based on the study of 370 cases of acute appendicitis upon which he operated during the eighteen months from June 1, 1917, to November 30, 1918.

The most common type of appendicitis encountered was the acute type. There were 176 cases of this type, with no deaths. The appendix was red, swollen, and stiff, and its peritoneal coat had been slightly roughened by the inflammatory process. Usually the peritoneum contained more or less odorless turbid fluid. In some cases the appendix showed a distinct constriction, the distal part being tightly distended and inflamed.

There were 17 cases of gangrenous inflammation with 1 death. In this group the appendix showed large or small areas of gangrene, but no actual perforation. It was distended and evidently at the point of rupture. Infection had begun beyond it in the peritoneum. The peritoneum contained turbid fluid which had the odor of a bacillus coli infection. In this class there was no definite abscess or general peritonitis but reddening and distention of the adjacent coils of small intestine were noted.

In 158 cases of perforative inflammations there were 18 deaths. In these cases a definite perforation was found which varied from a complete sloughing off of the appendix to a minute hole which had obviously just ruptured; in fact, once or twice the perforation occurred during the removal of the appendix. In the early cases the extravasated matter was a small quantity of dirty brown offensive fluid in the immediate neighborhood of the appendix; from this there was a progressive gradation through localized abscesses to spreading peritonitis, and beyond this to generalized suppurative peritonitis. In the earlier perforations the pelvis usually contained slightly offensive turbid fluid.

The total mortality of the three groups was 5 per cent. Earlier diagnosis and prompt operative treatment should bring all cases of acute appendicitis into



Group 1, in which the mortality was nil. At most, the mortality of acute appendicitis should not exceed 1 per cent. The high mortality is due to delay in treatment and for this delay modern text-books and teaching are largely responsible.

The initial symptoms of acute appendicitis are acute abdominal pain which at first is general and later tends to become localized in the right iliac fossa, vomiting, tenderness, rigidity of the right rectus, and fever, especially in young adults. When the pain is of the colicky type it indicates that the appendix is attempting to empty itself against obstruction.

Appendicitis is a combination of obstruction of the lumen of the appendix and infection behind the obstruction. The author believes that the lumen is always more or less obstructed before an acute attack of inflammation. In most cases it is the result of former slight and usually repeated infections. Rosenow has shown that the wall of the appendix contains in its substance a specific streptococcus, and it is probable that some increased activity of this organism is responsible for the lesions under consideration. Tuberculosis and carcinoma also are the etiological factors in a few cases of stenosis of the lumen of the appendix.

There is no doubt that faecal material enters the appendix and that the normal appendix can empty itself entirely and painlessly. When stenosis occurs the faecal matter which squeezes through from the caecum is retained, at least in part, and, mixing with the secretions from the wall of the appendix, eventually becomes inspissated and molded into the well-known concretion. When a concretion has formed, the conditions are favorable for an acute attack of appendicitis. In attempts to rid itself of its contents the appendix drives the concretion into the narrowed lumen where it becomes impacted and gives rise to acute abdominal pain.

If the attack does not pass off, complications arise. The appendix becomes more and more distended, and there is interference with its blood supply, either from the acute distention or from thrombosis in the veins. Finally perforation occurs. The perforation may vary from a minute hole into the appendicular mesentery or the general peritoneal cavity to complete gangrene and sloughing off of the whole organ. The further course of the condition depends on the fight the patient's defensive mechanism is able to put up and the severity of the bacterial invasion. Usually the danger is localized, the omentum seals up the opening by wrapping itself around the appendix or isolating any abscess that may form. The intestines also may come to the rescue, gluing themselves together. In some cases a large or small abscess may be formed in the pelvis, behind or to the outer side of the caecum, and in others in a less frequent but more serious area on the inner side of the caecum. In still others there may be a combination of these two conditions.

In the author's series an abscess developed in 89 cases, and in 58 cases was formed in the pelvis. If not treated surgically, abscesses may burst at various

points on the surface of the body, e.g., on the anterior abdominal wall, in the loin, on the buttock, or in the ischio-rectal fossa. In some cases they may burst into the rectum, the caecum, the vagina, the bladder, or the small intestine. Abscesses on the left side are uncommon unless there is a general peritoneal infection, but the possibility should be kept in mind as a long appendix may lie across the brim of the pelvis.

In 3 of the author's cases an abscess formed in a hernial sac on the right side; in 1, the inflamed appendix was in the sac, and in 2, the pus had spread from intra-abdominal appendicitis.

Occasionally subphrenic abscess and empyema occur. Secondary hæmorrhage from the deep epigastric vessels is another result of sepsis.

In Flint's series there were 6 cases of acute intestinal obstruction complicating the acute appendicitis. In 2, the obstruction was present at the time of operation. Both patients recovered, 1 after appendectomy and the other after the coils of intestine were freed and an appendicectomy was done. In the other 4 cases the condition followed operation. Three of these patients died.

The youngest patient in the series was a male 6 months old and the oldest a male 66 years of age. The incidence of the condition among females was greater between the twentieth and thirtieth years. This incidence the author attributes to menstruation as it is not unusual for an acute attack of appendicitis to begin about the time of the menstrual period.

The position of the appendix was noted in 161 cases. In 71 it hung down into the pelvis or lay along the brim; in 80 it was either behind or to the outer side of the caecum; and in 10 it was internal to the caecum, either in front of, or behind, the terminal ileum.

The condition with which the diagnosis of acute appendicitis was most often confused was acute salpingitis. Acute salpingitis does not usually necessitate operation, but no serious consequences result if an operation is performed needlessly.

Acute pneumonia, perforated duodenal and gastric ulcers, diverticulitis, acute cholecystitis, and perforated neoplasms of the large intestine have also been mistaken for acute appendicitis.

In all of the 370 cases an operation was done immediately. In 227 the treatment consisted of an appendicectomy and closure of the wound; in 124, of an appendicectomy and drainage; and in 19, of drainage alone, the appendix not being sought for either because the patient was too ill or the adhesions were too firm.

In regard to the technique of operation Flint states that he almost always uses the vertical incision, displacing the rectus inward. Having opened the peritoneum, he clips the edges to a tetra cloth or mackintosh cloth so as to hide the subcutaneous and muscular layers completely. If pus is present, he introduces gauze packing in sufficient quantity to form a thick barrier which will prevent contamination of the adjacent coils of small intestine. He mops up all free pus and then searches for the appendix.



He frees the appendix and divides the mesentery. He then crushes the appendix at its base with Doyen's instrument, ties a ligature at the proximal side, applies a clip to the distal end, and removes the appendix by cutting between the ligature and clip. The crushed stump is always tied in order to prevent hemorrhage into the bowel. The stump is buried by passing a Z suture of fine catgut, taking up the seromuscular coat and invaginating the stump while the stitch is tightened. This suture is buried by a second similar suture. The stump of the cut meso-appendix is stitched to the cæcum in such a way as to hide its raw surface. The wound is closed with a continuous catgut suture for the peritoneum, one or two silk-worm-gut sutures picking up all the abdominal wall down to and including the rectus sheath, interrupted catgut stitches for the anterior rectus sheath, and finally Michel clips to obtain accurate apposition of the skin edges. When the wound is sutured a dry dressing is fixed in place with a glue solution, but when drainage is necessary a 10 per cent saline fomentation is applied and changed frequently.

All patients are placed in the Fowler position when they are returned to bed. In most cases of perforation continuous subcutaneous or rectal infusion of normal saline is given. In very serious cases both may be necessary during the first twenty-four hours. Bowel action is stimulated toward the end of the first twenty-four hours by enemata.

Cases of general peritonitis are treated in much the same way, but a pelvic drain is used and as much fluid as possible is given subcutaneously and by rectum.

G. W. HOCHREIN.

#### LIVER, GALL-BLADDER, PANCREAS, AND SPLEEN

**Eisendrath, D. N.:** *The Clinical Importance of Anatomical Anomalies in Biliary Surgery.*  
*Boston M. & S. J., 1920, clxxxii, 573.*

Until recently the majority of surgeons have felt that congenital changes such as malformations, malpositions and variations in the blood supply of the abdominal viscera were a negligible factor in operations. The intensive development of certain fields of abdominal surgery, however, has made it absolutely necessary for the operator to be familiar with every possible alteration of congenital origin in order that he may avoid errors in diagnosis and operative technique.

The increase in the number of operations for the removal of the gall-bladder has been accompanied by the reports of many accidents due to the presence of anomalies of the bile-ducts and blood vessels of the region. Such variations receive either no mention at all or only brief mention in the standard works of anatomy and operative surgery. If the present teachings were correct, the surgeon would not encounter any special difficulties in technique in nearly 100 per cent of the cases he operates upon, but Ruge, Kunze, Descomps, Rio Branco, Behrend, and the author have shown that the normal mode of

union of the cystic and hepatic ducts is present in only 75 per cent, that various anomalies are present in the remaining 25 per cent, and that in at least 12 per cent there are two cystic arteries.

Accidents may occur because of lack of knowledge regarding these anomalies. Up to 1918 the literature contained the reports of 33 accidents to the ducts during operations on the biliary tract, and in the literature since 1918 the author has found 12 more.

This article contains illustrations of the different anomalies (angular, parallel, and spiral modes of union). Two deviations from the normal gall-bladder and cystic duct which have played a part in accidents during cholecystectomy are a very short cystic duct and a gall-bladder with its pelvis on the upper side and firmly adherent to the hepatic duct. When the former is present the hepatic duct is pulled out of its course easily and the juncture of the cystic, hepatic, and common ducts may be resected. When the latter is present traction may be exerted on the wall of the hepatic duct during the removal of the gall-bladder.

**Hoover, C. F.:** *Obstruction of the Hepatic Veins.*  
*J. Am. M. Ass., 1920, lxxiv, 1753.*

The author reports two cases of obstruction of the hepatic veins that have been under observation for a year. From the literature accessible he has collected 30 cases reported since the time of Budd in 1857. In only 2 of all the reported cases was the diagnosis made before death.

Several writers suggest that a clinical diagnosis is possible but in the opinion of others the lesion is purely a pathologic curiosity which cannot be differentiated from obstructive lesions in the branches or trunk of the portal veins.

Seventy per cent of the affluent blood flow of the liver is portal blood, and 30 per cent blood from the hepatic artery. The total efferent flow is through the hepatic veins. There is a free anastomosis between the bed of the hepatic artery and the bed of the portal vein. If obstruction occurs in the trunks of the hepatic veins, the pressure within the entire capillary system of the liver will rise not only from pressure in the portal vein but also from pressure in the hepatic artery the branches of which anastomose freely with those of the portal vein. The result of such obstruction will cause great distention of Glisson's capsule. The convexity of the upper surface of the liver will be increased, the edge rounded, and the hepatic resistance greatly increased. On the other hand, when there is obstruction of the portal vein, there will be a diminution in the size of the liver. Enlargement of the liver associated with ascites cannot be caused by increased resistance to blood flow from lesions in the portal veins. If there is obstruction in both the hepatic and portal veins, the liver will not be enlarged but ascites will follow from stasis in the portal radicles.

The essential clinical signs of obstruction of the hepatic veins are acute enlargement of the liver, convexity of its upper surface, increased resistance,



rounding of the edge, pain on pressure, and an ascitic transudate which is opalescent and contains numerous red cells with few white cells and does not clot readily on standing. The specific gravity of the transudate ranges between 1.004 and 1.014. The absence of evidence of disease of the hepatic parenchyma is also important. There is neither cholemia nor cholæmia, and urobilin is not increased in the urine.

If all sources of hepatic enlargement with the exception of venous stasis can be eliminated, it remains to be determined whether hepatic stasis originates from cardiac insufficiency, obstruction of the inferior cava above the ostia of the hepatic veins, or obstruction of the hepatic veins.

The clinical course of obstruction of the hepatic vein interpreted from autopsy findings and case histories proves that partial obstruction of all the veins or complete obstruction of some of the large veins may cause acute hepatic symptoms which will be followed by partial recovery. The fact that a clinical diagnosis of hepatic cirrhosis was made in most of the cases will indicate the character of the physical signs that are produced by the chronic course of the disease.

The number of cases of hepatic vein obstruction thus far reported makes it advisable to examine carefully the intrahepatic cava and hepatic veins at autopsy in all cases in which signs of hepatic disease with ascites were present.

The collected reports justify the suspicion that, in the past, obstructive lesions of the hepatic veins have escaped the pathologist's observation on account of failure to make a careful examination of the intrahepatic cava and its tributaries. They emphasize also the importance of carefully interpreting the relation of the clinical histories and the physical findings to disease of the liver cells, interstitial structures, and disturbances of blood flow in the portal and hepatic veins and the hepatic artery.

W. H. NADLER.

**Wile, U. J.: Two Unusual Phases of Hepatic Syphilis.** *Arch. Dermat. & Syph.*, 1920, n.s.i, 656.

The incidence of syphilis of the liver is second only to that of syphilis of the heart, and a fairly advanced degree of cirrhosis may occur without giving rise to clinical symptoms. The condition is most common in women. Alcohol stands out as a predisposing factor. The size of the liver depends largely on the stage of the disease at which it is seen rather than the form of the cirrhosis. During treatment the liver may recede rapidly underneath the costal border. During the period of hypertrophy there is also an enlargement of the spleen which is an early and constant finding.

The pathologic status of syphilis of the liver is still a debated question. Syphilitic hepatitis is due to direct involvement of the parenchyma on the one hand and primary involvement of the blood vessels with secondary changes in the parenchyma on the other. Usually there is a combination of both

features. Late syphilis of the liver is either diffuse or circumscribed. The diffuse form consists of multitudinous infiltrates and miliary gummata with extensive interstitial fibrosis. The circumscribed form consists of isolated infiltrates and larger gummata and leads to localized fibrosis. The end-result of either form is cirrhosis.

Neither of these types of hepatic syphilis may cause symptoms. In one case tumor is present, while in the other disturbances of the portal circulation lead to ascites. Syphilitic parenchymatous hepatitis may produce a jaundice of non-obstructive type and in such cases symptoms resembling those of acute yellow atrophy are produced. In the early stages a mild icterus associated with malaise, vomiting, and constipation (but no other intestinal symptoms), lumbago, and muscular pains is common, and a toxic condition may be present. The second stage is more definite and is characterized by a rapid decrease in the size of the liver, maniacal symptoms, intense headache, visual disturbance, leucin and tyrosin in the urine, marked psychic depression, restlessness, insomnia, convulsions, and delirium. With the exception of the jaundice the clinical symptoms resemble those of meningitis. There is persistent constipation, and death occurs finally during coma. At autopsy the typical picture of acute yellow atrophy is found, the organ being about one-third its normal size and weight. Unrecognized cases are invariably fatal. The course is usually longer than that of acute yellow atrophy, the average being eighty-four days. When arsphenamin is used a new type of jaundice develops which is due to the retention of arsenic in the liver. Although icterus gravis syphiliticus proves fatal if not recognized, most gratifying results may be obtained when it is diagnosed.

The prognosis is good in syphilitic cirrhosis with gummatous tumors predominating, less favorable in gummatous hepatitis with interstitial cirrhosis, and poor in the purely interstitial and diffuse type.

R. R. MUSTELL.

**Racchiusa, S.: A Case of Ictero-hæmorrhagic Spirochætosis in Man** (Un caso di spirochetosi ittero-hæmorrhagica nell'uomo). *Riforma med.*, 1920, xxxvi, 273.

The author reports the history and autopsy findings in a case of ictero-hæmorrhagic spirochætosis in a young soldier. The condition was of relatively brief duration but very grave from the beginning. Spirochætes showing the morphologic characteristics of those found in spirochætic icterus were discovered in the liver. The interstitial changes were relatively advanced as was shown by: (1) the prevalence of lymphocyte infiltrations not limited to the portal spaces alone; (2) the presence of a large number of collagenous fibers in the portal spaces; (3) the characteristic disposition of the hepatic cells; and (4) atrophy of hepatic cells and an abundance of the endocellular pigment usually found in atrophic hepatic tissues.

Worthy of note was the lack of lipomatosis, very few lipid granules being present in the hepatic cells. Possibly the fatty degeneration found by other authors was due to the degenerative changes which occur in the cadaver even in a short time. The Kupfer cells were hypertrophic. Other observers have noted particularly the presence of numerous globular and pigmented macrophages in the spleen. In this case the latter were absent but there was a partial myeloid reaction characterized by the presence of myelocytes and nucleated red cells.

The changes in the kidneys are usually difficult to discover because of the rapid postmortem changes and the delay in autopsies. In the case reported the autopsy was done almost immediately after death and both parenchymal and interstitial conditions in the kidneys could be noted clearly. The parenchymal findings were not of the type previously described. Most noteworthy was an increase in the volume of the cells and vacuolization of the sub-nuclear protoplasm. The regressive phenomena were rather limited, being confined to pyknotic nuclei and a slight degeneration of lipoidal type. The interstitial findings showed only infiltration of elements resembling lymphocytes.

W. A. BRENNAN.

**Erdmann, J. F.: Surgery of the Gall-Bladder.**  
*Med. Rec.*, 1920, xcvi, 901.

The author advocates surgery in gall-bladder disease because of the following facts: (1) medical treatment fails to cure and results in protracted illness; (2) in 7 per cent of cases presenting gall-bladder symptoms malignancy develops; (3) in non-surgical treatment there is great danger of making the patient a morphine addict; and (4) there is danger of perforation, peritonitis, and fistula unless operation is performed.

In gall-bladder surgery success depends also on the correction of associated lesions such as appendicitis, a gastric or duodenal ulcer, pancreatitis, or fistula. Unless the patient's condition contraindicates it, the author prefers cholecystectomy to cholecystotomy.

I. E. BISHKOW.

**Apolloni, G.: Pancreatic Lithiasis and Diabetes Mellitus** (La lithiasi pancreatica e il diabete zuccherino). *Policlin.*, Roma, 1920, xxvii, sez. prat., 482.

The author reports a case of diabetes mellitus of monoglandular pancreatic origin complicating bilateral pulmonary tuberculosis in a young man aged 20 years. At autopsy the pancreas was found to be a mere canal or cyst containing a large number of pancreatic calculi and gravel.

Histologic examination of the residual pancreatic tissue demonstrated altered and sclerotic acinous glandular tissue with well-preserved islets. Intense liver lesions were present which resembled those of a bronze diabetes, a finding which demonstrated that in severe diabetes intense hæmosiderinic pigmentation of the liver may be primary and inde-

pendent of anatomical alterations such as those due to atrophic or hypertrophic cirrhosis.

That the condition was undoubtedly a monoglandular pancreatic diabetes is evident from the fact that the pancreatic lithiasis alone caused atrophy of the organ and was not associated with disturbances in any of the other glands of internal secretion.

W. A. BRENNAN.

**Connor, E. L.: Traumatism of the Spleen.** *Canadian M. Ass. J.*, 1920, x, 504.

The author believes that rupture of the spleen is more frequent than is generally supposed.

In this article three cases are reported. One of the patients died before an operation could be performed but the other two recovered following splenectomy.

The diagnosis is based on: (1) the history of injury; (2) a definite interval between the injury and the time the patient realized that he was seriously ill (this does not apply to rupture of a hypertrophied spleen, in which the hæmorrhage is immediate, profuse, and rapidly fatal); (3) pain which is generally referred to the left chest and shoulder; (4) difficulty in breathing; (5) signs of internal hæmorrhage, i.e., cold white skin, soft rapid pulse, and subnormal temperature in the first six hours; (6) rigidity of the abdomen; and (7) an increasing area of dullness in the left upper quadrant of the abdomen and the left flank. In some cases vomiting may occur but as a rule nausea is absent.

Conditions to be considered in the differential diagnosis are perforated gastric ulcer or duodenal ulcer, rupture of the kidney, hæmothorax, and mesenteric embolus. The prognosis depends wholly upon the time which elapses between the receipt of the injury and the operation.

The author's conclusions are:

1. Ruptured spleen can be treated only as a surgical condition of the abdomen.

2. The severe symptoms may be delayed and therefore this condition should be more frequently borne in mind during the examination of patients with a history of slight injury to the lower left thoracic region.

3. When no injury can be found about the joint, pain in the left shoulder may be referred from the spleen.

4. Splenectomy is not a difficult operation and should be undertaken if reasonable operating facilities are available.

5. Ruptured spleen is a condition demanding early treatment.

H. J. VANDEN BERG.

**MISCELLANEOUS**

**Orndoff, B. H.: Pneumoperitoneum and X-Ray Examinations.** *Illinois M. J.*, 1920, xxxvii, 408.

The author has diagnosed 100 cases of abdominal conditions by pneumoperitoneum and the X-ray.

The apparatus employed consists of an oxygen tank, a water bottle indicator, a pressure gauge,



rubber tubing with a cotton filter, and a spinal puncture needle. The patient is placed on his back on an ordinary hospital cart before an upright fluorescent screen apparatus. The needle is inserted into the peritoneal cavity in an area of the abdominal wall under which are normal air-filled loops of intestine. The gas is then allowed to flow from the tank. If the pressure in the water bottle rises constantly the needle is either plugged or has not passed through the tissues of the abdominal wall. As soon as a few ounces of gas have entered the peritoneum the X-ray examination reveals its presence by a long, narrow line beneath the anterior abdominal wall. The gas is allowed to flow gently until this wall is lifted away from the abdominal viscera for a distance of 5 cm. The needle is then withdrawn and the puncture site covered with an antiseptic solution. The viscera surrounded by the gas are shown by very clear lines on the screen.

The author summarizes his experience as follows:

1. Pneumoperitoneum is not difficult to produce, and while a few points in the technique are essential, they require no special training other than that possessed by the physician.
2. The size, position, mobility, relative density, variations in contour, contents, and cavities of the abdominal viscera can be visualized and studied in a manner which opens entirely new possibilities.
3. Findings are made which seem to invite the conclusion that the bases for possibly new clinical disease entities have been established.
4. Peritoneal adhesions between the abdominal viscera and the anterior abdominal wall are demonstrated without difficulty. The importance of the functional pathology originating from this source will be studied carefully by the workers in this branch of medicine.
5. Fixation of the gastrocolic omentum to the anterior abdominal wall is frequently associated with vomiting with or without nausea. In seven cases this was relieved by pneumoperitoneum and returned when the gas was absorbed.
6. Perihepatitis, perisplenitis, and pericolicitis with fixation by peritoneal adhesions to adjoining

viscera offer new phases for the study of the functional pathology of these organs.

7. After pneumoperitoneum has been produced aid is offered in the diagnosis by the filling of the colon, stomach, intestines, bladder, kidney, etc., with oxygen. Variations in the diameter of the walls of the hollow viscera with changes in their relative density and the presence of new growths may be detected.

8. Postoperative peritoneal adhesions to the anterior abdominal wall may be prevented by keeping the peritoneal cavity distended with oxygen for a few days following operative procedures.

9. Pneumoperitoneum produced with oxygen is probably of therapeutic value in peritoneal tuberculosis.

H. K. BEGG.

**Tyler, A. F.: Injections of Gas into the Peritoneal Cavity for Diagnostic and Therapeutic Purposes.** *Minnesota Med.*, 1920, iii, 295.

Oxygen was discovered first by Scheele of Sweden and a year later by Priestley of England. In 1903 Brainbridge of New York began to use it in the abdominal cavity for therapeutic purposes. He concluded that oxygen introduced into the abdominal cavity is a cardiac and respiratory stimulant. It is of value also to maintain intra-abdominal pressure after the removal of large cysts or tumors and has been found useful in tuberculosis of the peritoneum.

The introduction of oxygen into the abdominal cavity for diagnostic purposes is very recent. In this country the work was begun in 1919 by Stewart and Stein of New York and at about the same time Orndoff of Chicago, working independently, used oxygen in the peritoneal cavity for diagnosis.

A dental oxygen tank is employed and by means of a needle the gas is introduced into the abdominal cavity until the patient complains of a sense of fullness. The abdominal viscera are brought out sharply in the X-ray picture. When the gas is introduced into the stomach or urinary bladder the thickness of their walls may be seen and tumors and adhesions discovered.

I. E. BISHKOW.

## SURGERY OF THE EXTREMITIES

### DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

**Reschke, K.: Stenosing Tendovaginitis; de Quervain** (Zur stenosierenden Tendovaginitis; de Quervain). *Arch. f. klin. Chir.*, 1920, cxiii, 464.

Reschke reports 10 typical cases of stenosing tendovaginitis manifested by severe pain upon movement of the thumb. The patients were all females. Reschke agrees with de Quervain that the primary disease is in the tendon sheath which gradually thickens and becomes narrowed. Later, small round-cell infiltration, deposition of fibrin, and secondary changes in the tendons follow. In the

beginning, rest and methods to induce hyperæmia may lead to a cure whereas in chronic cases longitudinal incision of the sheath of the extensor pollicis brevis and abductor pollicis longus is necessary.

ALFRED BRUNNER (Z).

**Hey-Groves, E. W.: The Crucial Ligaments: Their Function, Rupture, and Operative Treatment.** *Brit. J. Surg.*, 1920, vii, 505.

The majority of cases of internal derangement of the knee joint are attributed to misplaced semilunar cartilages, and the removal of the meniscus, regardless of its condition, has been the routine treatment.

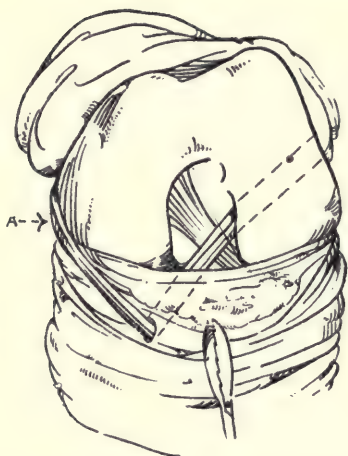


Fig. 1. Repair of the anterior cruciate ligament. The iliotibial band has been drawn through the external femoral condyle, the knee joint, and the internal tibial tuberosity, and then turned upward to supplement the internal lateral ligament (A).

The author advocates turning up the patella in every doubtful case in order that a careful search may be made for loose bodies, synovial fringes, fracture of the spine of the tibia, and rupture of the cruciate ligaments.

The anterior cruciate ligament runs from the upper attachment of the outer condyle of the femur downward, forward, and inward to the spine of the tibia. It limits the forward movement of the tibia on the femur and is made tense by extension of the knee. The posterior cruciate ligament is attached above to the intercondylar notch and runs downward, backward, and outward to the back of the articular surface of the tibia. This ligament checks the posterior displacement of the tibia which occurs during flexion. Both ligaments are made tense by internal rotation of the leg on the thigh. The author emphasizes the obliquity of the ligaments in the sagittal plane as this disposition of the bands makes them important factors in preserving the integrity of the joint. Any substituted ligament must be given the same oblique position.

Rupture of either the anterior or the posterior cruciate ligament is generally the result of extreme violence. Several of the author's patients were injured by shell explosions. In 14 cases treated by him the anterior ligament alone was torn in 10, the posterior ligament alone in 2, and both ligaments in 2. In most cases the ligament was torn from its femoral attachment and in no case was there any injury to the bone.

In injuries to the anterior cruciate ligament the tibia can be moved passively forward on the femur. Shifting of the body weight to the injured leg causes the tibia to slip forward. Injury to the posterior cruciate ligament permits the tibia to be displaced backward on the femur. Injury to both ligaments produces a flail joint.

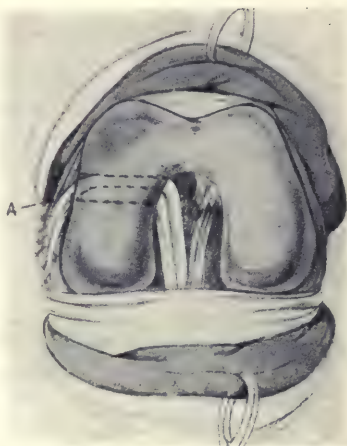


Fig. 2. Repair of the posterior cruciate ligament. The two tendons have been drawn through the tunnel in the internal femoral condyle and then turned downward to supplement the internal lateral ligament

The author makes a wide U incision in operating on patients with injured anterior ligaments; the tibial tubercle is chiseled off and the patella turned up. Holes are drilled and beveled through the external condyle of the femur and the front of the tibia. A strip of the iliotibial band, which retains its tibial attachment, is then pulled through the femur and the tibia, the knee is flexed, and the band is pulled taut and attached to the inner aspect of the internal condyle by suture and one ivory nail. The tubercle of the tibia is then re-attached by bone screws and the wound closed.

The same exposure is employed in operating on injuries to the posterior ligament. The semi-tendinous and gracilis tendons are cut, the proximal ends are sutured to the semi-membranous muscle, and the distal ends are pulled through the knee joint and threaded through a hole drilled in the internal condyle of the femur. This opens on the inner aspect of the intercondylar notch. The knee is extended and the ligaments are pulled taut and attached to the inner aspect of the internal tuberosity of the tibia.

The leg is placed on a back splint and two weeks later daily massage and faradism are applied to the quadriceps muscle. Six weeks after the operation a light plaster cast is applied and the patient is allowed to walk. A movable support is worn for from three to six months.

No trouble resulted from the wide exposure of the knee joint in the author's cases and he believes that such an opening is necessary to approximate the structures correctly.

None of the 14 patients operated on by the author was made worse. Four were not benefited, 4 were moderately benefited, and 4 were practically cured. Two were treated so recently that the outcome cannot yet be determined. A. J. SCHOLL, JR.



**Bazin, A. T.: Wounds and Infections of the Knee Joint.** *Canadian M. Ass. J.*, 1920, x, 416.

The author describes the general outline of treatment as carried out in 195 cases of penetrating wounds of the knee joint. In this series there were only 2 amputations and 3 deaths.

There are three phases to the treatment. The first consists of operative mechanical cleansing and immobilization. In all cases of effusion the exploratory needle was used. The presence of blood-stained fluid was interpreted as indicating a lesion of the synovial membrane. An X-ray examination was made to discover foreign bodies and bone lesions.

The operative treatment given varied. In cases of through-and-through wounds due to high-velocity bullets suspension and extension of the limb and aspiration of the joints were indicated. In these cases also a small injection of formalin in glycerine was given and repeated if necessary. If hæmarthrosis was present the joint was opened by a parapatellar incision, thoroughly irrigated, and closed in layers. When foreign bodies or bone lesions were found the joint was opened freely to permit the removal of the foreign bodies or detached bone fragments. Bone lesions were curetted or removed with the gouge, the cavity was irrigated, and the joint tightly closed in layers. Hæmostasis was always effected by the application of hot swabs or aqueous solutions of flavine before the wound was closed. Immobilization was obtained with the bent Thomas knee splint and 6 lb. of extension. The bed was raised to obtain countertraction and to facilitate the return of the venous circulation.

In the second phase of treatment tension was prevented by frequent aspirations to keep up the circulation of the cells of the synovia and prevent tearing of the perfect closure. In the type of case under discussion infections may occur along the track of the original wound, along the track of the aspirating needle, as a lymphangitis, or as the result of the bursting of involved bursæ, particularly the bursa beneath the internal head of the gastrocnemius and that which forms the sheath of the popliteus tendon. In the series of cases reviewed bursting of the bursa forming the sheath of the popliteus muscle was sometimes associated with infection of the superior tibiofibular joint. In such cases drainage was established by means of oblique incisions along the lateral margins of the suprapatellar pouch and transverse division of the fibers of the vasti. No packing was permitted.

The third phase of treatment consisted of the restoration of function, i.e., painless movement to the normal extent and stability. The author does not advocate Willem's treatment by early active mobilization. He insists that no motion should be allowed until the fifth day of normal temperature and normal condition and that if at that time motion lights up the infection renewed immobilization or further drainage is indicated.

R. G. PACKARD.

**Eikenbary, C. F.: Congenital Equinovarus; Report of 114 Cases.** *Surg., Gynec. & Obst.*, 1920, xxx, 555.

The author reports 94 cases of congenital club-foot which were treated by forcible correction with or without achillotomy, and 20 cases in which a cuneiform osteotomy was done.

The treatment is not at all difficult but failures are common because the operator forgets he is dealing with a triple deformity (equinus, varus, and adduction of the forefoot), he does not overcorrect the deformity, and he removes the retentive apparatus too soon.

Club-foot may be divided into three types: the moderate type in young babies, the moderate type in children over 6 months of age, and the severe type in children over 6 years of age. In the first type the treatment should consist of gradual intermittent manipulations given without ether every ten days or so, and the application of a cast in the position of greatest correction. The cast should extend above the flexed knee to keep it from being kicked off, to prevent rotation, and to relax the gastrocnemius. When full correction has been obtained the cast should be worn for one year.

In the moderate cases an anæsthetic is necessary and the correction should be made at one sitting, the varus and adduction correction being obtained first, and finally the equinus by subcutaneous division of the tendon of Achilles.

In the severe cases a cuneiform osteotomy extending through the entire width of the foot and a tenotomy of the Achilles tendon are necessary.

In conclusion the author emphasizes the value of weight-bearing in all three types after correction has been obtained.

R. G. PACKARD.

**FRACTURES AND DISLOCATIONS****Thomas, T. T.: Personal Experience with the Treatment of Fractures.** *Pennsylvania M. J.*, 1920, xxiii, 459.

The author believes that most of the deformity in cases of fracture is due to the direction of the force causing the fracture rather than to the pull of the muscles. To reduce the fracture, force must be applied along the same path but in the reverse direction. When the deformity is very great, however, he prefers to do an open operation. His conclusions are as follows:

1. A roentgen-ray study of the usual results in the non-operative reduction of fracture deformity would probably show them to be surprisingly poor. In fractures of the shafts of long bones with overlapping satisfactory reduction is probably impossible but non-operative treatment yielding a moderately poor result may be preferred to operative treatment yielding a better result.

2. Many fractures with deformity (chiefly those about joints) which would cause much crippling if unreduced may be reduced very satisfactorily by the application of a vigorous force in the opposite direction to that which caused the deformity. After

the reduction has been proved by the roentgen ray a fixation dressing may be applied and left in place for several weeks. An accurate reduction with several weeks' undisturbed immobilization will give quicker and more complete return of motion to the neighboring joints than a poor reduction of the deformity, however early or long passive motion is practiced.

H. J. VANDEN BERG.

**Gallie, W. E.: The Union of Septic Compound Fractures.** *Canadian M. Ass. J.*, 1920, x, 407.

For the treatment of gunshot wounds of the long bones, Leriche, in 1916, advocated esquillectomy, an operation consisting of wide excision of the wound, subperiosteal resection of all bone fragments from the fracture, careful preservation of the periosteum, and drainage. According to Gallie, however, non-union followed this procedure so frequently that it was discontinued.

The reason for the failure of esquillectomy is that periosteum is not osteogenetic, as has been proved by the experiments of Macewen and those of the author. Other factors are essential for union, notably the apposition and comminution of the fragments. In experimental studies of rib fractures and fractures of the radius Gallie found that the rib would regenerate in spite of constant motion of the fragments, the new bone emanating from the fragment ends, but that the radius would not heal unless it was immobilized. It was discovered also that comminution would effect union even if absolute apposition was not obtained. This difference between the two bones is due to the porous character of the ends of the rib fragments and the density of the ends of the radius.

Sepsis is regarded as a powerful stimulant to osteogenesis rather than as a factor responsible for non-union. The cause of non-union is failure of apposition or necrosis of fragment ends. The new treatment, which is seldom followed by non-union, includes the removal of sequestra and the bringing of the healthy ends into close contact with secure immobilization. In some cases excision of scars and sinuses and unhealthy granulations may be necessary with free opening down to the bone. Union was obtained within two months in 80 per cent of cases of septic compound fractures treated in this way.

Immobilization does not mean metal plates. Kangaroo sutures are better but best of all are external splints of plaster of Paris. The correction of faulty union should not be delayed until all infection has ceased but should be done as soon as possible, during the time of the subacute inflammation. In such cases union in the corrected position results promptly.

R. G. PACKARD.

**Ollerenshaw, R.: Habitual Dislocation of the Shoulder Joint.** *J. Orthop. Surg.*, 1920, n. s. ii, 255.

The cases reported are as follows:

1. Man of 26. Collier and professional football player. Ten dislocations of the left shoulder in

about one year. First recurrence two months after the original injury.

2. Man of 27. Army pensioner. Has had 29 dislocations in about seven years.

3. Man of 28. An epileptic who had his first dislocation during a convulsion and 18 recurrences in the past year and a half.

4. Man of 30. First recurrence a year after the original dislocation. In the last four years there have been 13 recurrences.

The deltoid flap operation, as first described by Clairmont and Ehrlich in 1909, was done in all of these cases within the past year. So far there has been no recurrence. One of the patients had had a previous operation, but the others had been treated conservatively.

The object of the operation performed is to reinforce the capsule in front with a flap of muscle stripped from the posterior part of the deltoid. Two incisions are made, one near the anterior edge and one near the posterior edge of the deltoid. Through the anterior incision the deltoid is split and the quadrilateral space exposed by dividing the pectoralis major insertion downward and separating the heads of the biceps. The space is then enlarged downward by dividing the upper edge of the tendons of the latissimus dorsi and teres major about  $\frac{3}{4}$  in. The anterior circumflex artery marks the upper limit of the operative field. Through the posterior incision the deltoid is split  $1\frac{1}{2}$  in. from its posterior edge clear down to its insertion and the flap is turned upward. The origin of the outer head of the triceps is now exposed and its uppermost fibers are separated downward. This clears the space from behind so that a channel is formed for the passage of the flap. A long forceps is next passed through from the anterior wound and the point of the flap is seized and drawn through. The flap is then sutured to the anterior surface of the subscapularis tendon. This gives it a firmer attachment than suturing it to the anterior edge of the split deltoid as described by Clairmont. It is important to have the flap as long as possible as it is apt to tear from its new attachment if it is too short.

After the operation the arm is bound to the side and should not be abducted beyond an angle of 120 degrees (upper angle) until after about a month. At the end of two months full range of motion is allowed. The patient expresses a feeling of security in the joint as though it were braced in front.

The recurrence of dislocation is due probably to loss of muscular balance with a certain degree of capsule laxity, and it is thought best to restore the muscular balance at the point where the dislocation usually occurs.

W. A. CLARK.

**Fort, F. T.: Pelvic Fractures.** *Internat. J. Surg.*, 1920, xxxiii, 144.

Pelvic fractures are probably more common than is generally supposed and may be single or multiple. As a rule the pubic bone is involved. Such fractures may occur at any age and in either sex



but for obvious reasons occur most often in adult males.

Usually fractures of the pelvis are due to crushing injuries, falls, gunshot wounds, parturition, or severe muscular effort. Separation of the pelvic ring in front and behind may be caused by the passage of a heavy wagon over the pelvis with a dragging motion. Separation of both sacro-iliac synchondroses is rare and usually associated with extensive fractures of other portions of the pelvis. Fracture of the pubic bone occurs most frequently through the horizontal ramus near the pectineal line. Fracture of the sacrum is caused by a forcible in-bending of the apex. Coccygeal fractures usually result from difficult labor. Fractures of the ilium and ischium are rare.

The diagnosis is not always easy, especially in cases of simple uncomplicated fractures. Aids to a diagnosis are crepitus, a local point of tenderness, pain on moving the lower extremities, ecchymoses of the perineum and scrotum, urinary disturbances, and X-ray examinations, the raying being done at various angles.

The prognosis is usually uncertain as it depends upon the force of the injury, the extent of the trauma, the patient's physical resistance, the degree of shock, and the damage sustained by adjacent structures.

The possible complications are: (1) damage to the membranous urethra; (2) rupture of the urinary bladder; (3) injury to the rectum; (4) damage to the iliac blood vessels and large pelvic nerves; and (5) a tendency to the development of suppuration in the loose connective tissues between the pubis and urinary bladder and to urinary infiltration when the urethra or bladder is injured.

In every case of suspected pelvic fracture the patient should be catheterized at once. Vesical or urethral rupture calls for immediate operative procedures. In cases of compound fractures the external opening should be enlarged, detached pieces of bone removed, and the cavity packed with sterile gauze. The Bradford frame is more or less essential in the treatment of all pelvic fractures. A simple separation of the symphysis calls for rest in bed and the application of a tight bandage around the pelvis, the limbs resting on a double inclined plane.

In sacral fracture a gloved or covered cannula should be securely packed in the rectum to maintain apposition of the fragments. Fracture of the coccyx, if the suffering is severe, calls for amputation. In simple cases of fracture of the ilium or ischium rest in bed in a position which gives the greatest muscular relaxation is all that is necessary.

LOUIS HANDELMAN.

**Jones, E. O.: The Treatment of Compound Fracture of the Femur.** *Northwest Med.*, 1920, xix, 143.

This article is based on 128 cases of compound fracture of the femur observed at Base Hospital No. 50.

Compound fracture of the femur has always been one of the most serious casualties of war. The mortality due to hæmorrhage and shock, acute infections (especially gas gangrene), and chronic sepsis is high.

Compound fracture of the femur is frequently complicated by septic arthritis due to the presence of longitudinal fissures. Such fissures may be so fine that they are not revealed by the X-ray.

Primary injuries of blood vessels are unusual, while injuries to the sciatic and anterior crural nerves are more common.

Deformity due to displacement and overriding is more variable in military than in civil practice. Whatever the type of fracture, the injury always extends much farther than would be supposed.

Frequently when there has been only a slight loss of blood severe symptoms of shock ensue—pallor, lividity, coldness and shivering, shallow respiration, and a feeble rapid pulse. These are due to a sudden vasomotor disturbance occurring immediately after the injury and subside immediately following immobilization and the relief of pain.

Practically all infection is carried into a limb from without, but the deeper structures show signs of infection earlier than the more superficial tissues. The degree of the infection depends upon the extent of the destruction of the muscles and anatomical conditions causing complete closure of the wound. Therefore if debris is not removed and the region exposed rapidly sepsis supervenes. Profuse and prolonged suppuration may set in, causing secondary abscesses, hæmorrhages, sclerotic and lardaceous changes in the surrounding tissues, and visceral degenerative changes.

Infected fractures are associated with more or less localized osteomyelitis. The periosteum is much more resistant than the bone or marrow. Sometimes sepsis is sufficiently severe to destroy all osteogenetic power and cause complete non-union.

Débridement is therefore the first and best procedure in the treatment of compound fractures. The wound should be enlarged, drainage established, foreign matter and devitalized tissue removed, and the medullary canal exposed.

Regarding the disposal of bone fragments there are divergent views. In the American Army all loose splinters were removed and all fragments with periosteal attachments were carefully preserved. This method gave the best results although suppuration was prolonged and encouraged.

Leriche and other French surgeons obtained excellent results with a routine removal of all fragments by careful subperiosteal resection. Such a procedure is indicated only in the first month before callus has been formed. After the beginning of callus formation the operation must be limited to the drainage of abscesses and removal of obvious sequestra.

External appliances are best for the reduction and fixation of compound fractures. Internal fixation (such as plating, banding, and wiring) was

given an extensive trial early in the war and was almost universally condemned.

The Thomas splint is the best appliance for suspension and traction in civil as well as in military practice. The posterior portion of the ring must press firmly against the tuberosity of the ischium. This position is maintained by vertical pull by means of weights, pulleys, and an overhead frame. The weights should just balance the limb.

Posterior support is obtained by means of flannel strips extended from one side bar to the other, and extension, by means of moleskin strips extending as high as the wounds will allow and traction over the end of the frame. The initial weight should be the maximum weight and should be gradually scaled down.

In fractures of the lower third of the femur direct traction obtained by means of calipers or tongs is more effective. Less weight is necessary with this method.

Traction must be applied to the distal fragment in the direction of the long axis of the proximal fragment. If possible, the hip, knee, and ankle should be slightly flexed.

The Hodgen splint is used when there are wounds near the hip joint as the ring of the Thomas splint would interfere with the dressing. With the Hodgen splint the limb is abducted and rotated externally, the hip is flexed, and the knee is kept nearly straight. An initial weight of as much as 40 lb. may be necessary.

The normal anterior bowing of the femur must be maintained in fractures in the middle third. Backward tilting of the lower fragment in fractures of the lower third is best overcome by flexing the knee to 90 degrees with traction in the line of the upper fragment. In such cases the Pearson adjustable knee-flexion attachment to the Thomas splint is of great value.

The most common deformities to be avoided are: (1) excessive shortening due to inadequate traction or poor position; (2) the loss of the normal anterior bowing of the shaft; (3) rotation of the lower fragment on the upper, either inward or outward; and (4) abduction of the upper fragment.

Non-union results especially when there is extensive destruction of bone substance and should be treated by bone grafting. Operative treatment should not be undertaken until at least six months after the closure of the wounds.

When union becomes firm the patient is given a walking Thomas splint. This is worn from six to eight weeks, during which time it is removed at night and several times during the day to allow knee flexion.

D. H. LEVINTHAL.

**Kelly, R. E.: An Operation for the Chronic Dislocation of the Peroneal Tendons.** *Brit. J. Surg.*, 1920, vii, 502.

The author reports two methods of preventing forward displacement in cases of chronic dislocation of the peroneal tendons. In the first method the

lower end of the fibula is exposed subperiosteally and a thin veneer-like graft 1 in. in length is removed from the lateral surface. The graft is then displaced backward to overlap the peroneal groove by  $\frac{1}{4}$  in. and is held in place by two screws. This method gave very satisfactory results after twelve months.

The second procedure obviates the danger of placing the screws too close to the joint. A drill hole is made in the fibula just above the malleolus, pointing backward and slightly downward. With a fine keyhole saw a longitudinal cut is made from the drill hole almost to the lower end of the malleolus and the graft is freed by cross cuts from the lateral surface of the fibula. The upper cut is slanted obliquely upward, the lower obliquely downward. The graft is thus made cuboidal in shape with its two larger planes medial and anterior and its smaller surfaces lateral and posterior. By backward displacement it becomes firmly wedged into its bed and is held without additional fixation. The amount of displacement is of course dependent on the obliquity of the saw cuts and their thickness. These should be so placed that when the graft is hammered backward it will fit and the overhang posteriorly will be about  $\frac{1}{4}$  in.

J. I. MITCHELL.

## SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

**Mouchet, A.: Cases of Limb Surgery** (Quelques cas de chirurgie des membres). *An. Fac. de med. Univ. de Montevideo*, 1919, iv, 773.

Since the beginning of the war Mouchet has operated on about 300 cases of nerve injuries. He believes that suturing of nerves gives satisfactory end-results in 10 per cent of the cases while neurolysis is successful in at least 50 per cent. The radial, the external popliteal, and the sciatic nerves recover their function much more rapidly than others such as the median and ulnar. The incision in nerve surgery should not be made exactly over the line of the nerve as in that case the operative scar may adhere to the underlying planes.

Mouchet calls attention to the inability of many practitioners to recognize cases of carpal injuries. If a displacement of a carpal bone is recognized in time reduction can be effected and full normal function will be recovered, but if it is not recognized or is badly treated it becomes almost incurable. In cases of swollen and impotent wrists a radial fracture is at first suggested.

In carpal luxations the luxation is situated low, the radial and ulnar styloid apophyses preserve their normal relations, the active and passive movements of the hand are very limited, and flexion of the fingers is impossible or greatly restricted. A special feature of carpal luxation is an increase in the anteroposterior diameter of the wrist.

When the absence of a radial fracture has been proved it may not be clear whether the injury is a scaphoid fracture or a carpal luxation. In a fracture of the scaphoid the swelling is in the external half



of the wrist, the pain is localized, and the only movement affected is the movement of the radial inclination of the wrist, that of the fingers being relatively free. In subluxation of the semilunar the functional disturbance of the hand is characteristic and there is the special sign of anteroposterior thickening of the carpus. As a rule the diagnosis may be confirmed by radiological examination.

In a carpal displacement reduction may be effected under anæsthesia if the basculation of the semilunar in front does not exceed 90 degrees. Three or four weeks after the injury reduction is difficult. The semilunar must then be removed and with it the upper fragment of the scaphoid if the latter also is fractured.

W. A. BRENNAN.

**Julliard, C.: Fibro-Adipose, Cartilage, and Bone Grafts in Reparatory Surgery** (De la greffe fibro-adipeuse, cartilagineuse et osseuse en chirurgie réparatrice). *Rev. méd. de la Suisse Rom.*, 1920, xl, 211.

In about 100 cases in which fat grafts were used Julliard did not find a single case in which the graft was eliminated when strict asepsis was maintained during operation. Local anæsthesia is usually employed to prevent nausea as in one instance vomiting caused the elimination of a graft. The graft takes well, maintains its volume, and retains its fatty nature for quite a long period.

Cartilage grafts are not eliminated as a rule unless there is suppuration. In 60 cases in which such grafts were used elimination occurred only twice. Cartilage is especially valuable in the repair of cranial losses and in facial plastics.

The chief objection to bone grafts is the facility with which they are eliminated immediately following operation even when strict asepsis is maintained. The larger the graft the greater the chance of failure in the operation, especially if fixation has been effected with metallic wire, plates, screws, etc.

The osteoperiosteal graft appears to take more easily. The author's experience has shown that the results were best when thin bone grafts with abundant periosteum were used.

Julliard finds that fat grafts are of value in the repair of war wounds and similar injuries. Cartilage grafts take with great facility and are maintained for some months without change, though finally they undergo a fibrous transformation with preservation of islets of living tissue. Whether or not there is complete transformation has not been determined. Autogenous bone grafts usually show clear processes of regeneration either internally or on their surfaces, and even after one or two years are not entirely transformed.

W. A. BRENNAN.

**Miller, O. R.: The Treatment of Congenital Club-Foot.** *Am. J. Surg.*, 1920, xxxiv, 165.

In club-foot there is an inversion of the sole and contraction of the tendon of Achilles which throws the weight on the outer side of the foot, usually at about the juncture of the cuboid and fifth metatarsal.

In approximately 45 per cent of the cases the condition is congenital.

The cause of the congenital variety is obscure, but is supposedly a faulty intra-uterine position which bends and twists the neck and head of the astragalus, making the lateral arch of the foot more concave, the inner border shorter, and the outer border elongated. As the patient grows older the common extensor digitorum longus tendon becomes permanently lengthened and the tibialis anticus, tibialis posticus, tendon of Achilles, and plantar fascia become shortened.

The treatment, which may be manipulative, mechanical, or operative, should be begun as soon as possible after the first week of life. In the early cases, manipulations to obtain an overcorrected position should be continued for twenty minutes daily, but if this is not possible some form of support is necessary between less frequent treatments. Very young children do not require an anæsthetic. With the foot held in marked eversion, a cast should be applied above the flexed knee to prevent a rotation of the leg and to secure the foot. The plasters should be changed weekly. If necessary, the tendon of Achilles may be divided subcutaneously. The casts should be renewed until the foot maintains the position of calcaneovalgus of its own accord and should then be left in place for several months in order that the stretching of the soft parts may be permanent and that contraction may take place in the peronei and extensor muscles.

In neglected and recurrent cases of long-standing, a bone operation is necessary. The author prefers the Albee operation. By this procedure the scaphoid bone on the inner side of the foot is divided into an anterior and posterior half. Then, with the foot stretched into the overcorrected position, a tibial graft is inserted and secured between the scaphoid fragments and the foot is placed in plaster in the overcorrected position. If the skin edges do not come together it may be necessary to let granulation take place.

This operation is an improvement over the others as the permanent lengthening of the inner border gives the foot a more normal appearance. Cook's operation of removing a wedge-shaped section of bone from the outer side of the foot at the site of the calcaneocuboid joint and then extending this removal transversely through all the bones of the tarsus makes a shorter foot. The Phelps' operation of dividing all tissues on the inner aspect down to the bone at the astragaloscaphoid joint and correcting the foot forcibly does not prevent recurrence. Hoke's operation consists of a subcutaneous osteotomy of the neck of the astragalus.

Following the operation the cast should be worn from six to twelve weeks and then replaced for at least six months by a club-foot brace such as that devised by Bradford and Lovett. After the removal of the brace, a shoe with a broad toe and a low heel raised from  $\frac{1}{8}$  to  $\frac{1}{4}$  in. on its outer aspect should be worn.

R. G. PACKARD.

## ORTHOPEDICS IN GENERAL

**Sutherland, R. W., and Christie, J. M.: Some Notes on Military Orthopedics.** *Brit. M. J.*, 1920, i, 762.

The authors review the results they have obtained in treating orthopedic conditions following war wounds. The patients are cared for in special hospitals situated on the seashore where the sunshine and salt air increase their appetites, diminish their neurasthænia, and make their hospital period a recreation and a vacation.

Rectal anæsthesia was found to be very satisfactory, especially in cases of injury to the head, neck, and chest, and for patients who had been gassed or were bronchitic. After a subcutaneous injection of morphine, 6 oz. of ether in 2 oz. of olive oil were slowly introduced into the rectum. Following the operation the rectum was thoroughly washed out with salt solution and 2 oz. of pure olive oil were introduced.

Vaccines aided in diminishing, and at times prevented, a reinfection when an operation was performed on a chronic wound. Careful asepsis was carried out. Sinuses were not followed as a routine, but an attempt was made to reach the focus of infection by the shortest route, carefully avoiding all nerves. The excision of infected wounds was found to be as satisfactory in chronic as in early cases. Bone cavities with osteomyelitis were excised completely and the overhanging edges were removed. Unnecessary trauma was avoided in these cases by using very sharp case-hardened chisels.

In a number of amputations in which the scar was adherent to the bone it was possible to insert a muscle flap under the skin. This insured a good stump without the further shortening of a re-amputation. The insertion of fat grafts between scars and deeper structures was not satisfactory. In a number of cases the scars were excised and sliding or Thiersch grafts were used to cover the denuded area.

Fat grafts were found to be very practical in preventing the re-formation of adhesions about tendons. The fat was replaced later by a fascial transplant, especially if the severed tendons were to be sutured.

End-to-end suture was the only method which gave favorable end-results. Fat transplants also were used to protect sutured nerves. Ankylosis is a very common result following injuries to joints. Forcible manipulation with the patient under the influence of an anæsthetic is rarely satisfactory in the presence of the massive adhesions which are caused by war wounds. Gradual stretching by means of mechanical appliances was found to give more favorable results. In many cases, especially when the joint was not in an unfavorable position and when nerve injuries were present, the joint cavity was not interfered with. In malposition excision was done in an effort to establish ankylosis in a more favorable position. Passive movements were begun the day following operation and the patient was

encouraged to move about as soon as possible. Osteotomy was done only in a healthy area of the bone. Medullary pegs were preferred to lateral grafts in repairing old fractures as they permitted the placing of a portion of healthy bone in firm contact with a vascular area in the affected bone.

Only a small amount of extra equipment was necessary in the care of these patients; the material found in any hospital may be adapted to meet the requirements.

A. J. SCHOLL, JR.

**Lane, W. A.: The Advantages Afforded by Extension in the Treatment of Diseased Joints.** *Lancet*, 1920, cxcviii, 1159.

The author discusses the method of treating diseased joints by extension. By means of an apparatus devised by Hoefftcke the inflamed articular surfaces are forcibly separated from each other without interfering with the function of the joint. Free movements are possible and keep the circulation and attached muscles in a normal condition. Without extension joint movements are impossible as the articular surfaces will become bruised, damaged, and inflamed. With the extension apparatus in place, however, the patient is able to lead his normal active life.

In disease conditions of the hip joint it is often necessary to employ forcible movements and extension before applying the apparatus. In diseases of the knee the apparatus should be applied at once, extension being exerted gradually.

The author compares the favorable results obtained in cases of diseased hip joints by the use of apparatus with those obtained with silver wire fixation and displacement of the articular surfaces. The wire fixation also permitted joint movement and at the same time separated the articulating cartilages.

A. J. SCHOLL, JR.

**Mackay, C.: The Value of Posture in the After-Treatment of Stiff Shoulder.** *Lancet*, 1920, cxcviii, 1266.

The term "stiff shoulder" as used in this paper does not include the old cases of arthritis or acute inflammatory processes with subsequent articular adhesions and osteo-arthritic changes limiting the motion of the joint, but is applied to cases in which there is weakness of the muscles of the shoulder girdle following some injury.

In many cases of weakness of the muscles of the shoulder girdle there is a definite mental element, the disability being exaggerated and the difficulties in the treatment thereby increased. The treatment generally applied is flexion at the side. This method is faulty because the force of gravity is not considered. The weight of the arm falls on the muscles of the shoulder girdle and as the muscles are the chief supporting structures a constant drag on them results which causes a reflex atrophy and at times a subluxation of the humerus. To overcome this drag the use of the abduction arm splint is recommended.



Early and absolute relaxation of the muscles of the joint is important. Later, voluntary movement should be encouraged. This is best carried out with the patient in the horizontal position so that the weight of the arm falls on the bed or table upon which he lies. The arm should then be slowly abducted as much as possible. The abduction may be facilitated by the use of some smooth object under the arm with chalk on it to minimize the friction. By progressive exercise the muscles are enabled to accommodate themselves to the load of the arm. Over-exertion causing spasm is to be avoided.

In the treatment of stiff shoulder the abduction arm splint is recommended. After all muscle spasm has disappeared systematic re-education of the muscles should be begun, starting with the minimal load position and gradually increasing the load capacity until full function has returned.

B. R. PARKER.

**Revel, L.: Temporary Disarticulation of the Foot for Tuberculosis** (De la disarticulation temporaire du pied pour tuberculose). *Rev. de chir.*, Par., 1920, lviii, 205.

Tuberculosis of the tarsals and metatarsals is most difficult to treat. The anatomical and physiological conditions of the foot are such that the disease is spread easily and treatment other than operative treatment is usually unsuccessful.

Of the surgical procedures applicable to tuberculosis of the foot the Ollier resection is the only one worthy of attention and even this is faulty as it does not provide sufficient exposure for the surgeon to see the lesions with which he has to deal.

As a procedure which does give sufficient exposure and which also meets all of the other requirements Revel advocates temporary disarticulation which

was practised by Delbet. By this method the foot is opened transversely as in the Chopart and Lisfranc techniques.

Such an opening necessitates the sectioning of the tendons, vessels, and nerves in the back of the foot, but Revel believes that it is the only method by which amputation may be avoided.

If branch incisions are made at the extremities of the transverse incision and parallel to the sides of the foot both surfaces of the tarsal and metatarsal bones may be examined and the bony and soft parts may be easily curetted or excised.

The author has treated three cases by the method described. In the first the scaphoid, cuboid, third cuneiform, posterior half of the first two metatarsals, and the posterior end of the last three metatarsals were removed. In the second case the entire anterior tarsal and the posterior ends of the last four metatarsals were removed. In the third case a temporary disarticulation of the instep was done. In tuberculosis of this region the astragalus is usually removed by means of lateral incisions to spare the tendons, but in the author's cases Delbet's method was used instead. In these cases also branch incisions at the extremities of the transverse incision were necessary and the transverse incision made was that used by Syme. The diseased soft parts and the astragalus were removed and the tibial, malleolar, calcaneal, and scaphoid surfaces explored. An excellent recovery resulted in every instance.

From these cases it is evident that even when fistulae are formed and the condition develops in the third decade of life tuberculosis of the tarsals and metatarsals does not necessarily demand amputation. Nearly always the condition may be cured if the infection is localized in the foot, the patient's general condition is good, and an operation is performed according to Delbet's technique. W. A. BRENNAN.

## SURGERY OF THE SPINAL COLUMN AND CORD

**Mott, F. W.: A Lecture on the Early Symptoms and Diagnosis of Diseases of the Spinal Cord.** *Brit. M. J.*, 1920, i, 857.

The recent war has emphasized the importance and the frequent difficulty of differentiating between early organic diseases and functional disease. The greatest difficulty was presented when the patient complained of subjective sensory phenomena, but no objective signs were observed.

Two subjective sensory symptoms, pain and paræsthesia, hold the first place in spinal cord disease. Pain is the most constant and often the first symptom. It is a striking fact, however, that only a very small percentage of patients complaining of pain in the spine suffer with disease of the spinal cord. In functional cases, as a rule, the exact spot at which the patient locates the pain can be readily shifted by suggestion. Occasionally, however, there is an underlying organic disease. This is particularly true if

the localized tenderness and spontaneous pain cannot be shifted by suggestion. Not infrequently new growths of the spine, aneurisms eroding the spine, and extramedullary tumors affecting the posterior roots are responsible.

The pain of an organic cord disease is termed pseudo-neuralgic; it is lancinating, boring, cutting, tearing, burning, continuous or paroxysmal, dull or acute, and segmental in its topographical distribution. Often it is accentuated by sneezing, coughing, blowing the nose, or defæcation.

A frequent cause of root irritation and one of the early signs of tabes is syphilitic meningitis. Lightning pains are rarely absent and usually constitute the earliest symptom of tabes. While severe neuralgic pains are noted in herpes zoster, the eruption locates the lesion in the posterior spinal ganglion.

In peripheral neuritis the additional objective signs of a sensory disturbance, such as tenderness of

the calves associated with anæsthesia and analgesia, permit a ready diagnosis.

Next to lightning pains, difficulty in starting micturition or in controlling the urine are among the earliest and most constant symptoms of tabes. Bladder crises and renal crises simulating the passage of a stone may occur. Gastric crises are not infrequently the earliest symptom for which the patient seeks advice. Rectal, intestinal, and laryngeal crises are less common. A painless spontaneous dislocation or fracture should always arouse suspicion. The most frequent and important diagnostic clinical sign is some pupillary anomaly.

A girdle pain, while common in tabes, is also an important early symptom of a focal meningitis or meningomyelitis. In young male adults syphilis is the most frequent cause of meningomyelitis which is by no means a late manifestation of this disease. Fournier long ago showed that the most severe and the largest number of cases of cerebrospinal syphilis occurred within the first year after infection and diminished in severity and frequency with each successive year. The serologic investigation of the spinal fluid is an invaluable aid in the diagnosis.

Another early symptom of spinal cord disease is dysæsthesia, manifesting itself as heaviness of the limbs, numbness, tingling, and sensations of heat and cold. This symptom may be present also in extraspinal disorders of the nervous system, in such conditions as Raynaud's disease, erythromelalgia,

arteriosclerosis, endarteritis, reaction to cold, neuritis, and the various paræsthesias occurring in neurasthenics.

Dysæsthesia may be the first symptom in acute or chronic spinal meningitis, acute or chronic myelitis, anterior poliomyelitis, myelomalacia, syphilitic meningomyelitis, and disseminated sclerosis.

Of the objective disorders of sensibility, dissociated anæsthesia is of greater frequency and importance as a diagnostic sign than total anæsthesia.

Sensory phenomena are transitory or absent, particularly in anterior poliomyelitis, progressive muscular atrophy, amyotrophic lateral sclerosis, and often in disseminated sclerosis. In the disseminated sclerosis, however, transitory objective sensory disturbances are very common. The associated emotional symptoms frequently lead to an erroneous diagnosis of hysteria.

In cases of extramedullary tumors of the cord and meningitis circumscripta a precise anatomical diagnosis is essential before operation may even be contemplated. The Brown-Séquard phenomenon is common in these conditions.

There are many cases of organic diseases of the spinal cord with a large halo of functional disturbance which can be removed by mental suggestion, re-education, and encouragement. In differentiating the functional and the organic disorders it is well to bear in mind that more mistakes are due to not looking than to not knowing. H. W. WOLTMAN.

## SURGERY OF THE NERVOUS SYSTEM

**Coleman, C. C.: The Technique of Operations upon Peripheral Nerves.** *South. M. J.*, 1920, xiii, 427.

There are three types of operation for peripheral nerve injuries: liberation of the nerve or neurolysis; suture; and transplantation.

Liberation is indicated when the nerve is compressed by scar tissue or bound up in callus. It should be done only when the interference with nerve function is extraneural for it cannot possibly be of help to paralyzed nerves when the neuraxes are destroyed or obstructed by scar tissue.

Suture is indicated in cases of anatomical interruption of the nerve or intraneural obstruction by fibrous tissue in which satisfactory signs of regeneration are absent. In the preparation of a nerve for suture all scar tissue must be completely removed and the healthy funiculi uncovered by serial sections made with a sharp knife. This may result in a considerable defect or extension of the joints of the extremity but such results may be overcome as a rule by flexion and freeing the nerve for some distance above and below the lesion. Gentle stretching of the peripheral segment to gain distance is permissible, and transposition of the nerve to a more direct course is especially valuable in lesions of the musculospiral, ulnar, and median nerves.

Tension on the line of suture should be avoided. Much time is saved by first exposing the nerve trunk above and below in the healthy tissue and continuing the dissection through the site of the injury. As soon as the nerve is exposed a silk suture is placed in the sheath and a similar identification knot inserted in the same plane on the opposite side of the lesion to prevent torsion of the nerve and malapproximation of the bundles. One penetrating suture of catgut is used for all nerves except the sciatic which requires two. A sufficient number of fine epineural silk sutures are placed to secure accurate approximation of the sheath.

When the line of suture rests upon a bed of dense scar tissue transplantation of a pedicled pad of fat and fascia is occasionally necessary to minimize the fibrous tissue formation about the nerve. In suture of the musculospiral nerve over the callus of the humerus this procedure is of undoubted value. Usually the intermuscular planes form an excellent bed for the nerve. Encapsulation by veins, tubes of fascia lata, detached fat pads, and insertion in muscle tunnels tends to increase the formation of scar tissue about the suture and may constitute a distinct handicap to regeneration.

Nerve transplantation is indicated when the segments of the divided nerve, after the removal of



the fibrous ends, cannot be approximated without harmful tension. The autogenous nerve graft taken from a superficial sensory nerve is the best material to fill in a defect in a motor or mixed nerve. The method of Huber by which a cable of several segments of a sensory nerve, generally the musculocutaneous of the leg, is transplanted into the defect seems best to fulfill the histologic requirements for regeneration.

The results of transplantation are by no means so successful as those of suture, and the procedure should not be employed except when end-to-end approximation and suture of the divided nerve are impossible.

Scars over the incision for the exposure of the nerve should be excised as frequently they heal very unsatisfactorily. It is unnecessary to em-

phasize the importance of a dry field and protection of the exposed nerve by warm, wet, saline pads.

A tourniquet is not necessary and may cause paralysis of a healthy nerve. Drainage is avoided by ligating every oozing vessel.

The prognosis of operation upon nerves has enormously improved as the result of a better conception of nerve regeneration, improved operative technique, and more intelligent postoperative care. Obviously perfect regeneration of the nerve trunk will be unsuccessful as regards function if fibrosis of the joints or muscles is not prevented by intelligent physio- and electro-therapy and the proper use of splints. The treatment should be begun at the time of the injury and continued until functional recovery is complete or becomes manifestly impossible.

H. A. MCKNIGHT.

## MISCELLANEOUS

### CLINICAL ENTITIES — GENERAL PHYSIOLOGICAL CONDITIONS

**Berkeley, W. N.:** Preliminary Report on a New Method for the Clinical Diagnosis of Toxic Thyroid States. *Med. Rec.*, 1920, xcvi, 1035.

The author found that the serum of patients suffering with Basedow's disease binds powerfully with the normal thyroid of dogs and does not bind with any other organ of these animals. Using dog thyroid as an antigen, he made fixation experiments on more than 175 human serums. In 40 of these cases a positive thyroid dyscrasia was suspected. Of the 40 cases, 18 were clinically undoubted cases of Graves' disease, 2 were probable cases of Graves' disease, 10 were doubtful, and 10 were probably not cases of toxic goiter.

On the basis of this test the 18 positive cases were reported one to four plus, the probable cases were positive, 6 of the 10 doubtful cases were positive, and 10 cases which clinically were regarded as not Graves' disease were negative. Of the 135 controls, all were negative except 1.

SAMUEL KAHN.

**Engelbach, W.:** Arterial Hypertension Associated with Endocrine Dyscrasia. *J. Am. M. Ass.*, 1920, lxxiv, 1619.

In an analysis of more than 500 cases of conditions due to disturbances of the endocrine glands observed by the author during the last four years it was found that 46 patients (about 10 per cent) had a blood pressure above 160. Cases in which nephritis or arteriosclerosis was suspected were excluded. The highest percentage of arterial hypertension was found in 46 patients with a pluriglandular dyscrasia. In 14 of these 46 cases (30 per cent) more than one gland was involved but in no case did the condition of a single gland so dominate the picture that it was considered the primary secretory disturbance.

Combined pituitary and thyroid hyposecretion was present in 12 cases (about 26 per cent of the cases of hypertension). In 11 cases (one-fourth of the whole number) the condition developed at the menopause and the glandular disturbances were considered merely a part of the climacteric. In 4 of these there was evidence of hypothyroidism; in 3, hyperthyroidism; and in 2, hypopituitarism.

Primary gonad insufficiency was present in 4 cases (9 per cent); 1 of these patients was a eunuchoid person, 1 was a late castrate, and 2 were early castrates. Next in frequency were thyroid conditions, which were present in 12 cases. Eight of these (17 per cent) were classified as cases of pure hypothyroidism, and 4 (8 per cent) as cases of hyperthyroidism. Conditions due to the pituitary gland were found in only 5 cases (11 per cent). In 4 of these hypopituitarism was present, and in 1, hyperpituitarism. One was a case of pituitary hibernation; 1, a case of pituitary headache (both reacted to substitution pituitary treatment); 1, a case of hypophyseal glycosuria; and 2 were cases of eunuchoid gigantism.

The diagnosis of arterial hypertension associated with endocrine dyscrasia is difficult and often doubtful. The important diagnostic objective is the exclusion of the following organic lesions:

1. All varieties of renal disease. Dependence is to be placed on complete and prolonged observation of the case, including repeated urine analyses, determinations of the concentration power of the kidney (Mosenthal renal test), the phenolsulphonephthalein functional test, and determinations of the blood retention products (total non-protein nitrogen, urea, creatinin, and uric acid), renal changes, and cardiovascular signs such as cor renalis, left ventricular preponderance (electrocardiogram), and accentuation of the second aortic tone, which are ordinarily associated with renal disease. The

variability of the blood pressure is important in the differential diagnosis. Marked vacillation of from 40 to 60 mm. in pressure in twelve hours or a rapid reduction in the pressure amounting to more than 60 mm., and brought about by treatment are not considered attributable to renal disease.

2. Arteriosclerosis. It is well known that frequently sclerosis of the visceral arteries is not associated with signs of sclerosis of the superficial or palpable vessels. A history of a previous disease that might have produced arteriosclerosis or a renal lesion, and a thickening, nodulation, tortuosity, or pulsating mobility of the superficial vessels are, of course, significant. Changes in the conjunctival and retinal vessels, the arch of the aorta, or the left ventricle of the heart (demonstrated roentgenologically) must also be sought. The clinical symptoms frequently associated with visceral sclerosis, sclerotic dementia, and angina pectoris, abdominis, and cruris are valuable diagnostic aids.

3. Other metabolic diseases; focal and general infections; subacute and chronic intoxication. Negative evidence as regards these conditions is also essential as they have a decided effect on the arterial tension.

4. Intermittent hypertension due to other causes. This is very similar to the type of arterial hypertension associated with endocrine dyscrasias and possibly many cases of this type really belong to the endocrine group. The intermittent or paroxysmal hypertension present in migraine, pregnancy, eclampsia, and the premenstrual state and other so-called functional, neurotic, or emotional arterial hypertensions would probably fall in this class of arterial hypertension or be disqualified entirely because they do not persist sufficiently long to warrant their classification as a definite syndrome. Their differentiation depends on repeated blood pressure determinations made during the same day or on a number of consecutive days. A single blood pressure reading is unreliable.

The prognosis of hypertension associated with endocrine dyscrasias is very much more favorable than that of high arterial tension due to definite vasculorenal lesions. While its course is much longer, it is associated with fewer disturbing symptoms. It is true, however, that in many cases arterial disease develops sooner or later and in some cases the condition leads ultimately to renal disease though it rarely terminates in uræmia. If the arterial tension is not reduced or reducible it may end in cerebral hæmorrhage or cardiac incompetence. For this reason the term "benign or functional hypertension" is a misnomer.

The treatment depends entirely on the internal secretory dyscrasia with which the abnormal hypertension is associated. Treatment should be directed primarily to the correction of the disturbed internal secretory balance. If this can be accomplished the blood pressure will be very much reduced in the majority of cases and frequently will return to, and remain within, normal limits.

The low-protein and salt-free diet ordinarily recommended for hypertension due to nephritis or arteriosclerosis is not indicated in the majority of cases of the type of hypersecretion under consideration. Measures to increase elimination, which are ordinarily beneficial in nephritis, are also frequently contra-indicated. It has been noted that in some instances drugs which cannot be used in other types of arterial hypertension because of their vasoconstrictive action are effective. For instance, it has been found that pituitary extract (the extract of the posterior lobe of the hypophysis) reduces the blood pressure in pituitary hibernation. Probably this is due to its effect on the carbohydrate or fat metabolism which is the basic cause of the arterial hypertension in these cases. Because of its hormone effect on the gonads, epinephrin also may be indicated in the menopause or gonad types. In conditions due to hypersecretion, such as hyperthyroidism and hyperpituitarism, surgery might aid in relieving the high blood pressure if the diagnosis is sufficiently clear to prove that the increase of glandular secretion is the sole cause of the hypertension.

C. H. DAVIS.

**Ohler, W. R.: The Treatment of Surgical Shock in the Zone of Advance.** *Am. J. M. Sc.*, 1920, clix, 843.

Ohler reviews the methods used in the army to combat surgical shock and summarizes the teaching of the Army School at Dijon as follows:

1. Control restlessness by using morphine in large doses.

2. Restore body heat by promptly warming the patient.

3. Restore body fluids. Force fluids by mouth—hot soups, tea and coffee during the first few hours; warm soda bicarbonate drinks and fluids by rectum to aid in overcoming the condition of acidosis; intravenous solution of 6 per cent gum acacia.

4. Give blood transfusions by the citrate method. This method is simple and yields uniformly good results.

In conclusion the author reviews the cases he has treated by the methods enumerated.

H. A. MCKNIGHT.

**Loeb, L.: Causes and Definition of Cancer:** *Am. J. M. Sc.*, 1920, clix, 781.

The following factors are analyzed as causes of cancer:

1. External stimulation of a mechanical or chemical nature. There seems to be a graded series of transitions from the normal growth energy of tissues to the increased growth energy and motility of cancer. Each kind of tissue maintains on the whole its characteristic growth energy and this is one of the essential features distinguishing cancer, benign tumor, and normal tissue. That long-continued irritation or even a single trauma may be an important factor in the origin of cancer has been proved conclusively.



2. Internal chemical stimulation, especially the action of internal secretions. The effect of hormones on the development of cancer is specific; a hormone influences the development of cancer only in those organs to which under normal conditions it has a specific relation. Castration has a definite influence on the origin of mammary cancer in mice, and it has been demonstrated that the influence of this hormone is quantitatively graded.

3. Heredity. That heredity plays a part in the development of cancer in mice is evident. The hereditary tendency to cancer does not follow the laws of simple Mendelian inheritance of monohybrid characters, but may be explained according to Mendelian principles if the presence of multiple hereditary factors is assumed. The inheritable tendency to cancer apparently consists of a tendency to develop cancer only in particular organs. Heredity is also a factor in the origin of cancer in man, but interbreeding and perhaps other factors have obscured its significance. It consists of the presence or absence of chemical or mechanical growth stimuli which originate within the organism and produce cancer if combined with other growth-promoting factors.

4. Embryonic character of tissue or disturbances of embryonic development. Young tissues grow more actively than older tissues, and the body fluids of younger organisms are more favorable to the proliferation of tissue than those of older organisms. Furthermore, an extensive migration of germ cells takes place within the embryo at an early stage of development and some of the embryomata which are found far removed from the ovary may be due to failure of the germ cells to reach their proper place.

5. Age. Most tissues are so constituted that within certain limits changes of environment call forth a response indicating increased activity. Old age may place cells in such a new environment.

6. Contact. The contact of normal tissues with cancerous tissue may result in the transformation of the former into cancerous tissue. This has been observed in cases of spontaneous tumors as well as in cases of transplanted cancers. It is probable that the process is another instance of the stimulating effect which one tissue may normally exert upon another.

7. Micro-organisms. It is possible that these may be of significance but no unicellular micro-organisms have been found in cancer and no agent can be isolated from cells in mammalian tumors.

8. General factors. All the factors which by chemical or physical means increase the proliferative energy of cells may act as causes of cancer. Factors within the cells make them more responsive to external growth stimuli. In many instances there may be co-operation of several such factors. Some of them are transmitted through heredity from generation to generation, others are variable and extraneous but all have one characteristic in common: they increase the growth energy

of normal tissues either directly or indirectly by sensitizing the tissues to the action of growth stimuli.

M. H. KAHN.

**Gordon, W.: The Factor of Fever in the Diagnosis of Cancer.** *Lancet*, 1920, cxcviii, 1309.

Fever is an uncommon accompaniment of cancer, but its occurrence should not be forgotten since thereby cancer may be overlooked and the condition considered inflammatory or the cause of the fever erroneously attributed to a complication.

Three causes of fever in uncomplicated cases of cancer have been suggested: (1) the rapid growth and multiplication of cells; (2) the death and absorption of toxic products from the rapidly-growing cells of malignant tumors; and (3) hæmorrhage and absorption of extravasated blood.

Cancers may be divided into three groups according to the fever associated with them:

Group 1. Cancers characterized by "growth fever" or by "complication fever". This group includes cancer of the liver, stomach, suprarenals, lung and mediastinum, long bones, and, rarely, the breast. Fever may persist for weeks in primary carcinoma or sarcoma of the liver and a differential diagnosis of cancer and abscess may therefore be difficult to make. Such conditions as suppurative cholangitis may be associated with cancer of the liver and are adequate causes for "complication fever".

Group 2. Cancers characterized by "complication fever" only. In this group are commonly the cancers of the gall-bladder, bile ducts, large intestine, small intestine, appendix, uterus, fallopian tubes, ear, and glands of the neck. In all such cases there is usually an associated infection which would cause fever.

Group 3. Cancers not associated with fever. In this group are cancers of the kidney, ovary, vulva, testes, penis, urethra, parotid, jaw, brain, spine, skin, muscles, heart, and pericardium.

The author draws attention to the fact that fever may be an important point in the consideration of the origin of hypernephroma since suprarenal tumors are usually associated with fever and renal tumors are not.

G. S. FOULDS.

**Bulkley, L. D.: On the Cure of Cancer.** *Med. Rec.*, 1920, xcvi, 941.

The author believes the cause of cancer to be a metabolic disturbance due to various factors, prominent among which are errors of diet — especially as regards meat, coffee, and alcohol — faulty living, and imperfect action of some of the organs of the body. The condition is therefore not a strictly local disease which can be cured by the knife, caustics, the X-ray, or radium.

Largely on the basis of laboratory studies interpreted as pointing to a purely local origin of cancer, surgeons have striven to cure cancer simply by extirpating the diseased mass and the surrounding tissues. The very frequent return of the condition and the steady rise in the mortality, however, have



convinced many that as a cure for cancer surgery is a failure. There are relatively few reliable statistics in regard to the ultimate cure and it is admitted that it can never be said that the patient is free from the danger of a relapse. The frequency of recurrences is due to the fact that generally nothing is done to remove or alter the cause which first induced the normal cells to take on and continue the abnormal action which resulted in the cancerous lesion.

The medical history and treatment of cancer have only begun. The author believes that eventually results comparable with those obtained in the treatment of tuberculosis may be obtained. Careful laboratory studies of the blood plasma, secretions, and excretions are necessary to advance the methods of treatment. Such studies have already constantly shown deviations pointing to metabolic derangement.

The author has obtained good results from dietary, hygienic, and medicinal treatment. Proper diet is unquestionably of the first importance in the prophylaxis and cure of cancer; without it other measures are relatively worthless. An absolutely vegetarian diet is essential. Proper hygiene is also necessary. In the medicinal treatment the use of potassium salts, based on the work of Ross, has proved beneficial. The author gives 15 gr. of potassium acetate with tincture of nux vomica and extract of cascara in one-third of a glass of water half an hour before meals. The amount of potassium acetate may be much increased.

While Bulkley is unable to present accurate statistics as to the mortality in cases of cancer treated medically, he states that it appears to be relatively low as compared with the acknowledged mortality of cancer. Undoubtedly the chance for cure is greatest in the early stages of the disease and it is at that time that the results of exclusively medical treatment have been most gratifying. Not all of the author's cases responded equally well. A few patients yielded to the solicitation of others and underwent operation, but this was rarely done with the author's consent. In fatal advanced and postoperative cases it was not necessary to give morphine.

W. H. NADLER.

**Holding, A. F.: Cancer Ameliorations and Cancer Immunity.** *Am. J. Roentgenol.*, 1920, n. s. vii, 306.

It is the purpose of this paper to correlate the known facts regarding the treatment of cancer and urge the co-operative employment of surgery and radio-activity to assist nature in establishing cancer immunity. Since there is no specific cure for cancer and since surgery and radiotherapy have each been proved of therapeutic value, a combination of the two promises better results than the use of either alone. Radiotherapy to be efficient must be administered in the most painstaking and scientific manner. A comprehension of how to administer the most heroic doses of radio-active energy with safety and when to administer it so that there may

be no procrastination interfering with surgical intervention is essential. As regards the relative merits of radium and roentgen rays, the author gives the following comparative table:

Radium	Roentgen Rays
Has more penetrating rays in smaller volume.	Have less penetrating rays in greater volume.
Easier to handle.	Technique very exacting.
Applicators small in size.	Apparatus large and heavy.
Portable.	Practically non-portable.
No danger of high tension electrical shocks to patient.	Patient must be protected from high tension shocks.
Can be used in cavities.	Use in cavities has been abandoned.
Effects easily confined to small areas.	Larger areas can be treated.
Treatment takes more time—average treatment four hours per area.	Treatment takes less time—average treatment five minutes per area.
Costs more.	Costs less.
No deterioration unless lost.	Constant deterioration due not only to wear but also to the fact that the apparatus soon becomes out of date.

In the author's opinion the most efficient treatment of cancer is based on: (1) the education of patients to the end that they will come for examination early; (2) the maximum safe erythema dose of radium or X-rays on the day previous to operation; (3) radical operation; and (4) postoperative prophylactic X-ray or radium treatments given with a careful technique.

ADOLPH HARTUNG.

**Mayo, C. H.: Jaundice and Its Surgical Significance.** *Surg., Gynec. & Obst.*, 1920, xxx, 545.

In the consideration of jaundice the surgeon must have in mind the various causes and complications of the symptoms.

Fifty per cent of the cases of jaundice are the result of gall-stones obstructing the common bile duct; 20 per cent are due to the absorption of bile from the liver, infective or catarrhal jaundice. The latter usually occurs in young persons and may or may not be accompanied by pain.

In the majority of cases jaundice is an indication of serious disease. The long-standing cases are probably hæmolytic acholuric jaundice caused by splenomegaly and relieved by surgery.

In from 5 to 8 per cent of cases the jaundice is due to severe infection of the gall-bladder and such cases are usually complicated by pancreatic lymphangitis and pancreatitis. The ducts are enlarged and contain flocculent material and stones.

Jaundice from cancer occurs in 15 per cent of cases; one-half from cancer of the liver, the other half from cancer of the pancreas, gall-bladder, and bile ducts. Short-circuiting the obstructed areas is of value in these cases.

Jaundice from cirrhosis occurs in about 8 per cent of cases. Courvoisier's observation appears to be substantiated.

The so-called "white bile" of long-standing biliary disease the author considers to be due to the fact that the power of the mucous gland to secrete the less absorbable mucus is greater than the power of the liver to secrete bile and forces the liver with its low blood pressure to absorb the bile.



Long-continued jaundice tends to slow the coagulation time of the blood. Coagulation may require from ten to twenty-five minutes. This condition is best treated by transfusion of acceptable human blood. In severe cases several transfusions are given.

If there is marked gall-bladder disease cholecystectomy is performed with exploration of the common duct through the cystic duct. In extremely severe infection of the gall-bladder cholecystectomy should be performed if the patient's condition warrants; otherwise cholecystostomy with or without choledochotomy. In these cases the gall-bladder is removed from above downward, the outer layer of the gall-bladder being left in its fossa. This prevents serious hæmorrhage. Suturing such a liver adds to the infective condition.

Injury of the common duct in biliary surgery is a cause of jaundice. This may result in intermittent jaundice. Early interference with the use of the Sullivan T-tube is imperative in these cases.

Gall-bladder disease is a frequent precursor of pancreatitis. In such cases the gall-bladder should be removed and drainage of the common duct should be established. If the gall-bladder is distended cholecystoduodenostomy is the operation indicated.

In late operations when the common duct has been injured during a previous operation the procedure for repair is extremely difficult. The end of the hepatic duct should be joined to the duodenum or the prepyloric region of the stomach, whichever is most accessible. The maintenance of this union is facilitated by the use of a tube devised by the author.

Jaundice is a later symptom of gall-stones in the majority of cases and increases the mortality.

In 2,400 operations during a three-year period the mortality of cholecystectomy was 1.8 per cent. The mortality increase depends on the severity of the condition and the amount of surgery performed. In 337 operations for cholecystectomy and choledochotomy performed during the same period the mortality was 3.2 per cent. In most serious cases of obstruction with malignancy the mortality was 16 per cent.

J. A. H. MAGOUN, JR.

**De Forest, H. P.: Raynaud's Disease; A Clinical Study of 17 Original Cases. *J. Med. Soc. N. Jersey*, 1920, xvii, 181.**

The author gives a very interesting biography of Auguste Maurice Raynaud to whom the medical profession is indebted for the best treatise ever written on the condition known as Raynaud's disease.

In his thesis, which was published in 1862, Raynaud describes the disease as follows:

"I propose to show that there exists a variety of dry gangrene affecting the extremities which is impossible to explain upon the basis of vascular obliteration; a variety characterized especially by a remarkable tendency to symmetry since it always affects similar portions of the body, the two upper

extremities, the two lower extremities, or all four at the same time. In certain instances the nose and the ears are also affected. I shall seek to prove that this kind of gangrene has as its cause a disturbance of the innervation of the capillary blood vessels."

Isolated cases of Raynaud's disease were reported as early as 1676, but no attempt was made to explain the cause of the condition and the reports were looked upon merely as the records of curious and exceptional cases rather than as reports of scientific value.

Raynaud's disease is a vascular disorder dependent upon vasomotor influences and characterized by three grades of intensity: (1) local syncope; (2) local asphyxia; and (3) local or symmetrical gangrene.

The first of the three characteristic stages, local syncope, cannot be regarded as a disease of itself as long as it amounts to nothing more than the familiar "dead fingers." The most characteristic feature of local syncope is the corpse-like pallor of the symmetrically affected parts. The color is usually like that of wax or tallow, but in rare cases is snow-white and occasionally of a yellow tinge suggesting the co-existence of a mild type of jaundice.

Local asphyxia, which is usually the second stage, is sometimes the first manifestation of the disease noted by the patient. The vasomotor constriction of the arteries relaxes but that of the veins persists. The resulting accumulation of partially oxidized blood in the capillaries produces an appearance of asphyxia which usually deepens in intensity toward the distal extremity of the affected parts. The actual tint may be bluish white, dusky blue, slate color, dark blue, black, violet or bluish red, or red with almost no admixture of blue. The violet color may become replaced by black if the attack continues or if gangrene supervenes.

In the third stage, symmetrical gangrene, the parts are first deprived of blood by an arterial spasm. This relaxes, but the venous spasm persists. The blood which remains in the affected parts is partially oxidized at first but by reason of its inability to escape becomes more and more incapable of supplying the tissues with the oxygen necessary to maintain their continued vitality. True gangrene then ensues. The gangrenous areas are usually symmetrical. As a rule the gangrene is superficial in character and the sloughs which sometimes occur may retain the natural form and appearance of the fingers, toes, or other parts affected. Even the nails have been reproduced without tissue defects. If a deeper gangrene occurs the slough is more extensive and a loss of portions of the body may result.

Thus far there have been no synonyms suggested for Raynaud's disease as a whole, but various names have been used to describe the different morbid conditions. Thus the terms *digitus mortuus*, *doigt mort*, *todder Finger*, *local anæmia*, and *regional ischæmia* have been applied to the local syncope, and the local asphyxia has been described as *local apnœa*, *local cyanosis*, *regional rubor*, *acroneurosis*, *acrocyanosis*, *acro-asphyxia*, and *vasomotor ataxia*.

The climax of the disease is symmetrical gangrene. Raynaud considered this one of its characteristic features.

The author studied 17 cases, 7 those of males and 10 those of females. Eight of the patients were born in Germany or were of German parentage, 4 were of English descent, and 5 were Americans by birth and by descent for at least three generations but came from English stock originally. So far as could be ascertained there was no admixture of the Scandinavian or Latin races in the ancestry in any of the cases observed.

At least 5 of the patients, 4 men and 1 woman, were engaged in occupations in which various metallic substances, particularly copper, were used more or less constantly. In the author's opinion it is possible that finely divided copper inhaled in small quantities for a considerable length of time may have an effect in the causation of a peripheral neuritis of the vasomotor or trophic nerves similar to that of lead.

It is evident that the disease is due primarily to some form of toxæmia, such as that resulting from epidemic influenza, intestinal disorders, etc. Predisposing factors are a neuropathic heredity and conditions which impoverish the blood. The most common exciting cause is exposure to cold.

Little is known of the pathology of Raynaud's disease. Few autopsies have been recorded and in those which have been reported no pathognomonic lesions were found.

There should be no difficulty in making a diagnosis of uncomplicated Raynaud's disease if the clinical picture of the three classical symptoms is kept in mind. The cases reported by the author and by others, however, emphasize the fact that the disease frequently precedes some other condition by which it may be overshadowed. In other cases the symmetrical symptoms may be coincident with those of some other malady and not infrequently may develop in the course and progress of some disease, the nature of which is already clearly established. Among the conditions to be considered in attempting a differentiation are syphilis, malaria, erythromelalgia, thromboangitis obliterans of Buerger, and diabetes.

In the treatment of Raynaud's disease the affected parts must be protected against sudden changes in temperature. As a nerve tonic the author gives a teaspoonful of the standard U. S. P. elixir of iron, quinine, and strychnine in a wine-glass of water fifteen minutes before each meal. Children may be given the elixir of nux vomica and calumba. To either one of these bitter tonics it is advisable to add 1/100 gr. of nitroglycerin to each dose. This acts as a vasomotor dilator. Nitrite of soda in 3 or 5 gr. capsules may be prescribed for the same purpose if desired.

Most patients with Raynaud's disease are anæmic and should be given iron.

Nutritious and easily digested food is essential. For an adult at least 3,000 calories are necessary. A definite increase in weight of 1 or 2 lb. a week is desirable.

The use of the faradic current is not contra-indicated and in some instances may have a certain psychic value. Malaria, syphilis, or any other disease which may be associated with Raynaud's disease should be treated at the same time.

G. W. HOCHREIN.

## BLOOD

**Hamilton, H. C.: Hæmostatic Agents.** *J. Lab. & Clin. Med.*, 1920, v, 574.

The prompt clotting of blood under normal conditions is due apparently to the fact that the action of antithrombin, which maintains the fluidity in the vessels, is arrested by the fluids exuding from the lacerated tissues. Thrombin changes the fibrinogen of the blood into an insoluble gelatinous mass called fibrin. The formed elements of the blood become enmeshed in the fibrin and a clot results. Thrombin as such is not present in the blood but is derived from a mother substance called prothrombin which is changed to thrombin in shed blood by the thrombokinase derived from the blood platelets and the lacerated tissues. Occasionally a shortening of the coagulation time is desirable and even vital. To obtain this two substances may be used, namely, thrombokinase and a substance to neutralize the antithrombin action.

A hæmostatic agent should have kinetic power supplied by an active thrombokinase; it should contain prothrombin in case this constituent is deficient, and should have a substance to minimize the action of the antithrombin and permit the formation of the thrombin. Hæmostatic serum is an agent of the type described.

The author describes a method whereby coagulants may be standardized by a biological test. The results of this potency test are conclusive as the action of the agent on the test animal is identical with its action in clinical practice.

SAMUEL KAHN.

**Pemberton, J. DeJ.: Practical Considerations of the Dangers Associated with Blood Transfusions.** *J. Iowa State M. Soc.*, 1920, x, 170.

The principal dangers associated with blood transfusion fall into four classes:

1. Embolism.
  - a. Air.
  - b. Blood clots.
2. Cardiac and vascular complications.
  - a. Acute dilatation of the heart.
  - b. Myocardial changes.
  - c. Arteriosclerosis.
  - d. Suspected cardiac lesions.
3. Infection.
4. Agglutination or hæmolysis of the donor's corpuscles.

The danger of introducing air into the circulation in sufficient quantity to exert an ill effect, as in extensive operations on the neck, may now be easily avoided by the simple citrate method of blood trans-



fusion since air in the circulatory system is dangerous only when it is present in large quantities. The small-caliber needle and low column of blood absolutely prevent the introduction of blood clots.

Acute dilatation of the heart demands constant recognition. For the aged with arteriosclerosis, for the anæmic with myocardial impairment, and for patients suspected to have cardiac lesions the procedure must be slow and the quantity of blood limited.

There should be wider recognition of the possibility of disease transmission by blood transfusion. Syphilis is the disease most apt to be transmitted in this manner. The Wassermann test is not infallible since it may be negative in 35 per cent of the cases of late lues and is always negative in the first few days of the primary lesion. The indication for transfusion must be urgent to offset the chances in using a professional donor. A donor not belonging to the patient's family should have not only a negative Wassermann test but also an examination negative for syphilis, the tests being made by a competent syphilologist. Unless such a donor can be had, supportive measures should be employed such as rest, fresh air, nourishing food, and tonics of iron and arsenic.

The chief immediate danger in blood transfusion is the introduction of incompatible blood and the consequent agglutination of the donor's corpuscles. This is detected from hæmoglobinuria, increased urobilin, and phagocytosis of the red cells. In 1,032 blood transfusions at the Mayo Clinic severe reactions occurred in 12 cases. In 9 cases in which it was possible to regroup the bloods of the donor and patient an error (usually clerical) was found in the initial blood test.

The onset of the reaction is early in the transfusion, after the introduction of from 50 to 100 ccm. of blood. In order of their development the symptoms are tingling pains shooting over the body, fullness in the head, an oppressive feeling about the precordium, excruciating pain in the lumbar region, redness of the face, cyanosis, labored respiration, and slow pulse rate varying sometimes from 20 to 30 beats per minute. The patient may lose consciousness for a few moments. Urticarial eruption of the face or whole body appeared with these symptoms in half the cases reported. Later the pulse becomes rapid and thready, the skin cold and clammy. In from one-fourth to one-half hour there is a chill followed by fever of 103 to 105 degrees and possibly by delirium. Jaundice may appear later. Gross hæmoglobinuria is almost constant. Usually the introduction of only 50 to 100 ccm. of incompatible blood is not fatal, but following the injection of 500 ccm. or more fatal results are to be expected.

Blood tests and groupings accurately performed preliminary to transfusion prevent accidents due to incompatibility of blood. Of 2,500 transfusions in the Clinic with properly tested blood there has not been a single group reaction. The danger of

giving incompatible blood can be avoided by using blood from a Group IV patient as the corpuscles of this group of donors are not agglutinated by the serum of any others.

G. E. SUTTON.

**Sehrt, E.: Artificial Ischæmia** (Ueber kuenstliche Blutleere). *Arch. f. klin. Chir.*, 1920, cxiii, 428.

Artificial ischæmia may be induced with the Sehrt clamp. Before the clamp is applied the limb is suspended vertically, the blood massaged out of it, a bandage is applied to a point above that at which the clamp is to be applied, and a sterile towel is wrapped around the limb. The advantage of the Sehrt clamp over the Esmarch bandage is that during the operation the former may be released and tightened at will and asepsis is not endangered. The clamp may be applied even before the clothing has been removed from the limb. RAESCHKE (Z).

#### SURGICAL DIAGNOSIS, PATHOLOGY, AND THERAPEUTICS

**Loeb, L.: A Comparative Study of the Mechanism of Wound Healing.** *J. Med. Research*, 1920, xli, 247.

On the basis of earlier studies on wound healing and of later comparative and quantitative studies made by Addison, Spain, Akaiwa, and the author in the course of the last ten years, the investigation herein reported was undertaken to separate the various factors concerned in wound healing and to analyze each one separately. Wound healing is a composite process in which activities of various kinds showing definite quantitative variations interact with each other.

Quantitative differences in the process having been noted in each species, the data thus obtained were compared in order to separate the essential factors underlying the process from varying conditions of a more accidental nature. While at present the analysis is still far from complete, a survey of the findings, Loeb believes, will give a provisional orientation which may serve as the starting point for further investigations. The experiments and their results are summarized as follows:

In response to the wound stimulus changes consisting of amœboid cell movements, mitotic cell multiplication, and an increase in the cell size, the thickness of the stratum germinativum, the number of cell rows, and the number of cells occurred in the epidermis. All these variables, with the exception of the number of cells, were studied quantitatively under different conditions as regards the depth and size of wounds and compared in different species. The curves which represented the changes in all of them were profoundly influenced by the closure of the wound. This was the case in wound healing toward which cell activities tended and which was the turning point in the various curves.

The amœboid movements of the epidermis seemed to take place steadily until closure was reached. The two plates of epidermis, coming from opposite



sides and meeting, exerted upon each other a pressure which varied in strength under different conditions. On the whole, the amoeboid movement was continuous throughout the different periods of wound healing or sometimes showed a gradual slight decrease.

Movements of the epithelium did not seem to be limited to cells adjoining the wound, but appeared to extend from farther back toward the center of the defect; a movement of cell rows from the old epithelium toward the center of the defect seemed to continue until the period directly following wound closure.

The wound exerted a cumulative effect on all the variables except amoeboid movement; in particular, therefore, on those depending on cell multiplication and increase in size of the cell and nucleus. At the same time, however, the effect of the wound decreased with increasing distance from the constantly shifting border of the defect. Lastly, the condition of the "soil," vascularization, and proliferation of the connective tissue were of importance. These three factors in combination explained the variations which were found during the course of wound healing.

All of the variables mentioned with the exception of the amoeboid movements were at their maximum at about the time of the closure of the wound—either just preceding this time (in the old epithelium) or at or directly following the closure (in the center of the defect). After this period a decline took place which varied somewhat in the different variables.

The curves representing the changes in cell size and the number of cells in different areas of the wound were more flat and similar to each other than those for other variables. This was true in several series of experiments. As far as the cell size was concerned, it was true also as regards the curves for the different species of animals. The wound healing appeared to tend toward the production of a definite, and as far as possible, an equal number of cells throughout the different periods of wound healing and at the different areas of the wound. Moreover, as established by Akaiwa, it seemed as if all the other activities were subordinated to this tendency.

Increasing length and depth of the wound within the ranges examined increased all the activities of the tissues. Increasing length of the wound increased directly the rapidity of amoeboid movement. The greater the size of the defect as compared with the circumference of living epithelium, the more rapid was the amoeboid movement. The contraction of the wound was also more marked in larger wounds, but was a later manifestation than epidermal amoeboid movements.

The significance of contraction varied in different species. The greater contraction and the more rapid amoeboid movements sometimes led to a more rapid closure of the larger wounds in certain species. In species in which, as in the rat, contraction played a more subordinate rôle, the closure took place earlier

in the smaller than in the larger wounds. All this applied to the range of sizes of wounds examined. Shallow wounds closed more rapidly than deeper wounds.

The length and depth of wounds influenced also the other variables which depended upon cell multiplication and changes in cell size. To a great extent this effect was indirect, depending mainly on the time of closure. The later the closure, the greater the increase in these variables, the higher the maximum. Possibly, however, a direct effect was exerted on these variables in addition by the size and depth of the wounds, the larger and deeper wounds having a greater effect than the more shallow and smaller wounds.

All the activities of the epidermis during wound healing, the amoeboid cell movements as well as the production of living tissue, showed an intensity which on the whole was parallel to the energy displayed by the tissue in the normal state. However, in some species the wound stimulus sometimes led to a greater use of reserve energy than in others. The maximal as well as average increase in the size of the cells and nuclei during wound healing, if expressed in per cent of the normal figures, was very similar in all the species. The ratio between the size of the cells and nuclei, however, was characteristic for each species. On the whole it was maintained in wound healing as well as in the normal tissue, although there was some shifting.

The so-called physiological regeneration of tissues was not a regenerative process, but the expression of a primary inherited tendency to multiply, inherent in certain tissues and characteristic for each species. This primary tendency to grow and multiply determined, on the one hand, the intensity of cell multiplication and desquamation, and on the other, the normal structure of the tissue.

An attempt was made by the author theoretically to explain the various phenomena measured during wound healing. The reactions seen were considered essentially as reactions of cells toward foreign bodies. The phenomena observed in amoebocytes were taken as the prototype of these changes. Surface changes in cells leading to phenomena of agglutination occurred in response to these stimuli. Amoeboid movements, as well as cell multiplication, were caused by the same environmental changes. Association of stereotropism and a tendency toward centrifugal growth explained the extension of tissues, both reactions taking place in response to the same stimulus. The centrifugal movements resulted sometimes if the cells moved constantly in the direction toward a change in electrical potential. Amoeboid movements, phagocytosis, and the formation of foreign-body giant cells represented different manifestations and degrees of the same reaction.

Intense degrees of stimulation sometimes led to pathologic reactions such as agglutination of cells on the one hand and amitotic division of nuclei on the other, the latter taking the place of mitotic division of cells which occurred under normal conditions.



Such a combination of syncytial formation with intense migration and amitotic division of nuclei leading to the production of plasmodia was found also in certain other cases in which the stimulus was of a different character (chorionic wander cells).

G. E. BEILBY.

#### EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

**Berry, F. B.: The Regeneration of Smooth Muscle Cells.** *J. Med. Research*, 1920, xli, 365.

This study was begun by the author following the receipt of a uterus, into the wall of which a curette had been thrust four days previously.

*Gross specimen.* Boggy uterus measuring 6.5 by 5.5 by 5 cm. The endometrium was bloody. On one side was a low, flat projection into the uterine cavity which on section was found to run out into the wall as a dark wedge of hæmorrhage. It was in the shape of a cone or pyramid the base of which was formed by the flat area and the apex of which was about 0.6 cm. from the peritoneal surface. No tumor was found.

*Histological examination.* Acute endometritis with hæmorrhage and fibrin both on the surface and penetrating well down in to the myometrium. Necrosis of muscle fibers surrounded by early granulation tissue and active young muscle cells — large and basophilic — in which numerous mitotic figures, both monasters and diasters, could be seen. That these were muscle cells was evident from their location and arrangement and the type of fibrils as demonstrated by Mallory's phosphotungstic acid-hæmatoxylin stain. This condition of activity extended on all sides some little distance from the site of injury.

So far as the author has been able to ascertain, this is the only case on record in which unquestionable regeneration of smooth muscle in the human body, or any attempt thereat, has been noted. A case reported by Busachi, he states, is open to doubt as it seems possible, because of the poor development of histologic technique at the time, that smooth muscle and connective tissue cells were confused.

In order to determine whether this activity on the part of smooth muscle was of constant occurrence, two investigations were undertaken. In the first, two rabbits and three guinea-pigs were employed. Laparotomies were performed, the uterus incised, and the wound carefully closed under aseptic conditions. In from two to five days the uterus was removed and immediately fixed in Zenker's fluid. Paraffin sections were then cut and stained with Mallory's eosin-methylene blue and phosphotungstic acid hæmatoxylin. In every instance the results obtained were practically identical with those observed in the human uterus examined. There was first the immediate reaction to the injury, with necrosis of fibers, hæmorrhage, fibrin, and exudation of a relatively few polymorphonuclear leucocytes. About

this area of inflammation was the zone of repair containing young fibroblasts and leiomyoblasts, many mitotic figures being present in the latter, more even than in the former. In these and subsequent experiments smooth muscle and connective tissue cells were differentiated by their location and arrangement and also by the type of fibril formation.

In the second series of investigations the stomachs of two rabbits were incised and traumatized with forceps in two widely separated areas. Paraffin and celloidin sections were then made of specimens obtained at four- and six-day intervals and fixed in Zenker's fluid. The study of the incised wounds disclosed a picture similar to that seen in the study of the uterus but somewhat more complicated in detail.

In summarizing this work the author first points out that present ideas concerning the regenerative powers of smooth muscle are indefinite and too conservative. Although different investigators have found mitotic activity following injury, the consensus of opinion at present is that, while there may be true regeneration in cold-blooded animals, in the higher vertebrates and man such regeneration is insignificant.

This belief, it seems to the author, is based upon a misconception and confusion in the definition of regeneration. To regenerate means to generate again or produce anew. This is exactly what smooth muscle cells do in their response to injury. Following injury sufficient to cause necrosis there is active regeneration of smooth muscle cells both in man and other warm-blooded animals. Here, in the islands of regeneration, new stroma is apparently formed under the stimulus of the epithelium just as is the cases in an epithelial tumor. While only the fibroblast and its derivative, the osteoblast, working with vascular endothelium can produce new tissue, the meaning of regeneration as applied to smooth muscle cells was expanded so as to include and require not merely the power of reproduction but growth by extension with the ability to penetrate and replace scar tissue and the formation of new muscle tissue with its own stroma as well. No tissue cells except those of tumors have this ability.

In the author's experiments the scar itself, as in almost every kind of reaction to injury, consisted of vascularized fibrous tissue, but closely abutting on both sides was active proliferation of the muscle by mitotic division. As healing became complete, the scar contracted and thus stretched and approximated the newly formed muscle fibers from what may be called the "pseudo-callus" on either side of the lesion. In this way it tended to fill in the gap left by the injury.

The importance from a surgical standpoint of close and accurate approximation of the edges of a wound through smooth muscle tissue, therefore, is at once apparent for it is only in this manner that a maximum of new muscle and a minimum of scar can be assured.

G. E. BEILBY.



**Teale, F. H., and Bach, E.: The Factors Leading to the Removal of Bacteria from the Peripheral Circulation and Phagocytosis.** *Proc. Roy. Soc. Med.*, Lond., 1920, xiii, Sect. Pathol., 77.

In previous experiments Teale and Embleton found that bacteria inoculated into the circulation rapidly disappeared from the peripheral circulation and could then be demonstrated only in internal organs such as the lung, liver, and spleen, and in the marrow.

The removal of bacteria was then investigated by Teale and Bach in a series of 47 experiments upon rabbits. The results of these experiments are summarized as follows:

All forms of bacteria were rapidly removed from the circulating blood and collected in the capillaries of the liver, spleen, lung, etc. This removal occurred with pathogenic, virulent, or non-pathogenic bacteria and was not caused by the action of antibodies acting as agglutinins or opsonins. The process was purely physical and due to the fact that the bacteria, being foreign particles, caused the formation of an incipient clot in which they became entangled. The aggregation and phagocytosis were greatly delayed by anticoagulants.

Phagocytosis by the fixed tissue cells and leucocytes was the same with pathogenic and non-pathogenic bacteria.

Antisera did not cause the removal of bacteria in secondary bacteriæmia by virtue of agglutinins, etc. as they were not foreign sera. The same result was obtained by the inoculation of other bacteria. The free bacteria in bacteriæmia became entangled in the masses of clot formed and were attacked by the phagocytes with the other bacteria inoculated.

G. E. BEILBY.

**Loeb, L.: On Differences in the Results of Various Kinds of Syngenesioplasmic Transplantations in Dependence upon the Relationship Between Donor and Host.** *J. Med. Research*, 1920, xli, 304.

In a former communication Loeb analyzed the mode of inheritance of individuality-differentials by means of syngenesioplasmic transplantations in the rat. In a second paper he discussed the character of the reactions on the part of the host which took place after syngenesiotransplantation. In the course of these experiments he found some indications that the results of the transplantations might vary according to the relationship between the host and the donor. He therefore decided to test the influence of the differences in relationships between host and donor on the outcome of syngenesiotransplantations.

Three series of experiments were carried out. In the first, the hosts and donors were brothers or sisters; in the second, the mother was the host and the child the donor; and in the third, the child was the host and the mother the donor. As in the earlier work, the thyroid glands of guinea pigs were used.

Among the group of syngenesiotransplantations definite differences were found in the strength of syngenesiotoxins which developed after transplantation. The toxins were strongest after transplantation from child to mother and weakest after transplantation into brother or sister. In transplantation from mother to child they seemed to have an intermediate position, but to be nearer the character of the syngenesiotoxins which developed after transplantation into brother. The toxins which developed after transplantation were comparable to a spectrum at one end of which were the homoiotoxins and at the other an absence of toxins after autotransplantation, the various lengths of syngenesiotoxins forming the center.

The behavior of lymphocytes, fibroblasts, and vessels toward the syngenesiotoxins represented a reaction on the part of different tissues to the same kind of chemical agency. However, the reaction of the fibroblasts and vessels occurred only when the syngenesiotoxins were produced in such a quantity that the effect became apparent within the first twelve days after transplantation, while the reaction of the lymphocytes sometimes became marked at a late date in cases in which at an early period after transplantation the syngenesiotoxins were not yet sufficiently strong to call forth the fibroblast and vascular reaction. With certain exceptions which were indicated in this paper, both reactions ran a parallel course. It appeared probable that with the progress of time the syngenesiotoxins collected in increasing strength within the transplanted or neighboring tissue and thus brought about the delayed reaction.

Preliminary results obtained in multiple syngenesioplasmic transplantations indicated that the syngenesio- and homoiotoxins were of a complex character and that a further analysis of the syngenesiotoxins and homoiotoxins might be accomplished by cross transplantations.

From the agreement between the results obtained previously by syngenesiotransplantation into the rat and the results of these experiments on the guinea pig it appears probable that the findings have a general application and also that they are of practical significance inasmuch as they seemed to indicate the superiority of brother or sister over child and probably also mother as the donors of the tissue.

G. E. BEILBY.

**Brown, W. H., and Pearce, L.: Experimental Syphilis in the Rabbit. II. Primary Infection in the Scrotum. Part 1. Reaction to Infection. Part 2. Scrotal Lesions and the Character of the Scrotal Infection.** *J. Exper. M.*, 1920, xxxi, 709, 729.

In general, the reaction in the scrotum to inoculations with *treponema pallidum* became apparent in from seven to fourteen days after the inoculation but was subject to considerable variation. The early reaction took the form of an oedematous swelling and congestion associated with a new



growth of vessels or an infiltration with more or less proliferation of fixed tissue cells. These reactions were either confined to a small circumscribed area of the scrotum or were of a diffusely spreading character. As the infection advanced the infiltration, proliferation, and secondary changes such as exfoliation, necrosis, and ulceration, became the most conspicuous features.

The course of the reaction in the scrotum was essentially the same as that in the testicle; it was periodic in character and marked by a phase of active progression followed by quiescence or by regression and renewed activity.

The scrotal reaction resembled that in the testicle also in its varying character. Sometimes it appeared first as a circumscribed focus of reaction which later became diffuse, and at others as a diffuse reaction which subsequently became more localized.

The lesions produced as a result of this reaction were of two general types, one a circumscribed indurated granulomatous lesion closely resembling the chancre in man, the other a diffuse infiltration more analogous to the secondary skin lesions of man. Both groups presented marked individual variations and possessed no fixed status, being subject to frequent and decided transformations. After a period varying from a few weeks to many months the scrotal lesions disappeared. G. E. BEILBY.

**Wislocki, G. B., and O'Connor, V. J.: Experimental Observations upon the Ureters, with Especial Reference to Peristalsis and Antiperistalsis.**  
*Bull. Johns Hopkins Hosp.*, 1920, xxxi, 197.

The authors studied the behavior of the ureter in living dogs and rabbits under various experimental conditions.

After partial ligation of the ureter its lumen increased in diameter and its musculature hypertrophied. When a partially ligated ureter was examined several weeks or months after operation spontaneous peristalsis and frequently anti-peristalsis were found. The peristaltic waves were always more vigorous and occasionally more frequent than those seen in the normal ureter. Vigorous antiperistaltic waves, if not already present, were elicited by pinching. The application of a crystal of barium chloride to the surface of the dilated ureter caused the formation of a constriction ring from which peristaltic waves proceeded in both directions. The ureter below the partial ligature exhibited normal spontaneous peristaltic contractions.

The lumen of the completely ligated ureter was somewhat larger than that of the ureter which was only partially ligated and the musculature was also hypertrophied. The completely ligated ureter seldom showed any spontaneous peristaltic movements and usually did not react to stimuli. When part of the contained fluid was released, however, violent peristaltic and antiperistaltic movements began. These movements were in no way distinguishable from those observed in the partially ligated ureter,

Bands of muscle from both partially and completely ligated ureters contracted vigorously when suspended in warm, oxygenated Locke's solution.

Beads of small caliber were propelled down the ureter of the dog without any difficulty by a series of peristaltic waves and finally expelled into the bladder, no trace of their presence being left in the ureter. Beads of somewhat larger diameter required a longer period to traverse the ureter and stimulated the ureteral musculature to prolonged peristaltic exertion before they were expelled. None of the beads obstructed the passage of peristaltic waves from the pelvis to the bladder. As a result of the passage of several such beads the ureteral wall became slightly hypertrophied.

Finally beads were employed which became lodged in the lumen of the ureter, usually near the renal pelvis or in the intramural segment. These caused moderate dilatation and hypertrophy of the ureteral wall above the point of obstruction. Vigorous peristaltic waves came down the hypertrophied ureter from the renal pelvis but invariably stopped at the bead. Below the bead other peristaltic waves began and proceeded toward the bladder. Antiperistaltic waves were not observed to arise spontaneously at the point of obstruction but were readily called forth by gently pinching the ureter just above the bead.

When moderate retention was produced in a rabbit's bladder with good muscle tone the ureterovesical sphincter was occasionally prevented from closing as it does normally after each gush of urine from the ureter and the intravesical pressure projected a column of fluid into the ureters. In an animal with quiescent ureters this influx was difficult to produce. When ureteral peristalsis was stimulated by the injection of barium chloride, however, the bladder content was nearly always regurgitated if a moderate degree of intravesical pressure was present. It was very apparent that observations upon cadavers and excised organs were practically valueless in the study of regurgitation as in such cases the bladder and the ureters lack tone and peristalsis, which are essential for regurgitation.

The authors observed the behavior of a ureter in four normal dogs when a catheter was inserted through the ureteral orifice. The results were quite uniform. Normal peristaltic waves were observed passing down the ureter at regular intervals but the majority of them appeared to subside on reaching the tip of the catheter and failed to reach the bladder. Reversed peristaltic waves did not originate in the wall of the ureter at the tip of the catheter even when the tip of the catheter was purposely twisted and moved vigorously upward and downward. Finally, Locke's solution and sodium bromide were allowed to enter the ureter by gravity through the catheter. The response of the ureter was the same in all four dogs. The peristaltic waves traveling down the ureter immediately became stronger and more vigorous. When the injection was stopped the fluid was gradually expelled and



peristaltic activity subsided, but if the injection pressure was increased, the ureter became distended and peristalsis ceased entirely. Reversed peristaltic movements were never observed during these injections.

G. E. BEILBY.

**Abel, J. J., and Nagayama, T.: On the Presence of Histamine in Extracts of the Posterior Lobe of the Pituitary Gland and on Preliminary Experiments with the Pressor Constituent.** *J. Pharmacol. & Exper. Therap.*, 1920, xv, 347.

Infundibular extracts carefully made from fresh glands (long boiling or long exposure to acids having been avoided in the preparation) contain a small but readily detectable amount of histamine. Extracts used in therapeutics contain larger quantities of this amine. In eighty 1 ccm. phials of one of the more powerful commercial extracts it was estimated that nearly 2 mgm. of histamine were present. A 1 ccm. phial contains, therefore, about 0.025 mgm. of the powerful base.

The presence of histamine depends upon the method of preparing the extract, the degree of its acidity, the time that has elapsed since it was made, and the method of sterilization employed.

Brief treatment of freshly prepared infundibular extracts with hydrochloric acid on the water bath, or boiling such extracts at the reflux condenser with low concentrations of this acid — 0.5 per cent HCl — for half an hour completely destroys the power of the extract to increase the blood pressure and causes a marked increase in the amount of free histamine.

Extracts which have been subjected to treatment with acid always cause a pronounced fall in the arterial pressure instead of the rise usually induced by normal or untreated extracts. The fall in the blood pressure is due to two substances: B, a histamine-like substance, which gives the Pauly but not the biuret reaction and is soluble in alcohol but not in chloroform; and C, histamine.

The power of infundibular extracts to stimulate plain muscle, however, is not completely destroyed by treatment with hydrochloric acid. Tests on the guinea pig's uterus showed that about 20 per cent of this power is retained. The residual oxytoxic activity also is due to the presence of the substances named B and C. These two substances are concerned in this residual action on the uterus in the same ratio as in the action which lowers blood pressure, i.e., approximately in the proportion of 4:1.

Histamine and the substance resembling it are apparently not specific constituents of the infundibulum. They appear together in animal extracts of all kinds and are easily obtained by hydrolyzing proteoses. They varied in amount in the different animal extracts and preparations studied. It appears, however, that infundibular extracts are especially apt to break down and to yield no inconsiderable amount of histamine.

The authors report their preliminary observations of the constituent of the infundibulum which raises

the blood pressure and describe highly active pressor salts which in their action on the uterus are many times more powerful than histamine. The action of hydrochloric acid on these pressor and oxytoxic derivatives appears to be similar to that observed when pituitary extracts are treated with acid.

From their observations the authors conclude that the infundibulum contains but one active specific substance or hormone and that this substance not only causes a rise in the blood pressure but also stimulates plain muscle. SAMUEL KAHN.

**Loeb, L.: Heterotransplantation of the Thyroid Gland.** *J. Exper. M.*, 1920, xxxi, 765.

In previous experiments the heterotransplantation of the skin of the guinea pig and of the pigeon was studied by the author. At that time he thought it desirable to perform additional experiments in which glandular tissues, free from bacteria, would be used instead of skin which is exposed to bacterial contamination. In this article he reports experiments on the heterotransplantation of the thyroid in mammals.

The purpose of these investigations was twofold. It was desired first to find the cause of failure in heterotransplantation, and second, to use heterotransplantation as an additional method by which to analyze the laws underlying the reactions of various kinds of tissues toward each other.

The results of these experiments are summarized as follows:

After transplantation of the thyroid of the guinea pig into rats there was a primary injury of the transplant, noticeable as early as three, four, and five days after the transplantation. The tissue was less resistant and was preserved only under the best conditions. The number of mitoses was much diminished in the transplant, but mitoses appeared as late as nine days after the transplantation, this being the latest time at which living tissue was found.

Epithelium was preserved best in the neighborhood of growing fibroblastic tissue, and growing epithelium attracted fibroblasts. Few fibroblasts grew between acini. The fibroblasts had a tendency to form fibrous tissue. Dense fibrous tissue compressed the acini and contributed to their destruction. The vascularization of the graft was very poor but some capillaries were found penetrating between the acini. The collection of lymphocytes around the acini was only casual and was found where fibroblasts were active, especially around the blood vessels in the capsule of the graft. On the whole, the heterotransplanted tissue did not attract lymphocytes to any marked extent. Connective tissue and lymphocytes contributed only secondarily and to a minor extent to the destruction of the heterotransplant.

After transplantation of the thyroid of the rabbit into rats the last mitoses were found nine days after transplantation but living acini were observed as late as eleven days after transplantation, and ducts



of squamous epithelium even later. Different kinds of tissue seemed to show a different degree of resistance to the action of heterotoxins. The difference in the resistance to heterotoxins corresponded to the difference in the resistance of various tissues to other kinds of injurious influences. On the whole, the thyroid of rabbits was better preserved in the rat than the thyroid of the guinea pig; there was also more mitotic activity in the rabbit thyroid.

The reaction of the tissues of the host toward heterotransplanted rabbit thyroid was similar to the reaction to heterotransplanted guinea pig thyroid.

After transplantation of rabbit thyroid into guinea pigs well preserved thyroid was found not later than eight days, while the last mitoses appeared six days after transplantation. The number of mitoses was very small. The host tissues behaved in a manner characteristic of heterotransplantation. It is probable that slight infections and the presence of polynuclear leucocytes were responsible for the somewhat inferior results obtained in this kind of heterotransplantation.

After transplantation of cat thyroid into the rat, signs of degeneration in the transplanted acini appeared at the end of the first week and increased during the second week. The last well-preserved acini were found at fourteen days and a few degenerating acini were still visible as late as eighteen days after the transplantation. Almost all of the pieces were entirely necrotic in the third week. A limited number of mitoses were found only five, nine, ten, and eleven days after the transplantation. There was a decided lack of vascularization in the transplants, which was especially noticeable in the second week after the transplantation. Fibroblasts penetrated at various places between the acini and, together with a few lymphocytes, occasionally destroyed some of them. After the ninth day the presence of fibrous tissue around the acini was noticeable. It compressed the acini and thus contributed to their destruction. Even the heterotransplanted thyroid exhibited a restraining influence on the connective tissue which was greater than that presented by dead material. The behavior of the lymphocytes toward heterotransplanted thyroid of the cat was similar to their behavior toward other heterotransplanted thyroid. G. E. BEILBY.

**Graham, E. A.: Sodium Carbonate in Chloroform Poisoning.** *Arch. Int. Med.*, 1920, xv, 575.

Chloroform is dissociated in the body in such a way that free hydrochloric acid is formed and it is probable that the action of this liberated hydrochloric acid is responsible to a great extent for the toxic effects of chloroform. The evidence for this assumption is as follows:

1. The formation of three molecules of hydrochloric acid from one molecule of chloroform outside the body by oxidation, in the presence of water, suggests the possibility that the same reaction takes place within the body in the presence of water and available oxygen.

2. Experimentally, hydrochloric acid produces the same lesions in the liver as those found in cases of chloroform poisoning.

3. Free hydrogen and free chlorine ions are demonstrable in the necrotic areas of the liver.

4. Observations on other products of methane—dichloromethane and tetrachloromethane—showed that these substances produce central necrosis of the liver and that this property is in direct proportion to the amount of hydrochloric acid theoretically yielded by each of them in its breakdown.

5. Other alkyl halides of the same type as chloroform (bromoform and iodoform) produce lesions identical with those produced by chloroform. In the case of iodoform, hydriodic acid is formed in the body, as is shown by the fact that neutral salts of this acid are excreted in the urine.

6. The property of producing central necrosis of the liver is common to alkyl halides in general since ethyl chloride, ethyl bromide, ethyl iodide, and ethylene bromide produce lesions typical of chloroform poisoning. That ethyl bromide and ethyl iodide are decomposed in the body in such a way that hydrobromic and hydriodic acids are formed is shown by the fact that inorganic bromine and iodine are found in the urine after inhalation of these substances.

In experiments on animals the author found that sodium carbonate in hypertonic sodium chloride solution partially inhibited the production of the lesions by chloroform. The toxic effects also were less marked in the animals which received the alkali.

Since the decomposition of chloroform into three molecules of hydrochloric acid is an oxidation process which takes place in the presence of water, it is not surprising that the liver, an organ in which oxidation processes are very active, should show the anatomical changes due to chloroform poisoning most conspicuously.

SAMUEL KAHN.

## ROENTGENOLOGY AND RADIUM THERAPY

**Pfahler, G. E.: The Roentgen Rays in the Diagnosis of Obscure Conditions.** *Internat. J. Surg.*, 1920, xxxiii, 179.

There are many cases in which the symptoms are not typical of any particular disease but might be caused by a number of conditions. In such instances every diagnostic method, including the roentgen ray, should be used to determine whether or not an organic lesion is present. After an injury, for example, a careful roentgen study of the bones should be made to rule out fractures even when fractures cannot be demonstrated by other methods. In disease of the bones, the examination is never complete without the use of the roentgen ray.

The roentgenological examination may reveal congenital anomalies such as cervical ribs and clear up confusing clinical pictures. To be complete, such a study of the abdomen should include the spine, the sacro-iliac region, the kidneys, the ureters



and bladder, the gall-bladder, the stomach, the duodenum, the appendix, the cæcum, and other portions of the colon. In the search for focal infections the roentgen ray may give valuable aid regarding the teeth, the sinuses, and other foci. Examinations of the chest may show that the cause of a persistent cough is an unsuspected foreign body.

The author's conclusions are as follows:

1. The roentgen rays are of value in the diagnosis of practically all obscure conditions in the body.
2. The organ involved is not always indicated by the character of the symptoms, and frequently an X-ray study must include more than the organ to which the symptoms refer.
3. Good roentgenograms are essential for accuracy of diagnosis, but much greater skill and wider knowledge are necessary to interpret the roentgen pictures correctly than to make them.
4. The purchase of an X-ray outfit does not make a roentgenologist any more than the purchase of a set of surgical instruments makes a surgeon.

ADOLPH HARTUNG.

**Stevens, R. H.: The Efficient Dosage in Deep Roentgen Therapy.** *J. Michigan State M. Soc.*, 1920, xix, 225.

Since too conservative treatment of malignancy will result only in failure and may even stimulate the growth to greater activity, it is a prime essential in radiotherapy to regulate the dosage for the results desired as far as this is compatible with safety. The action of roentgen rays and radium on the various types of malignant growths differs greatly; the more highly differentiated the type of cell from which the growth develops, the less responsive it is to treatment. In the less responsive cases even the dose that seriously burns surrounding normal tissue may not destroy the malignant growth. The results of roentgen-ray and radium therapy are both local and constitutional and to each of these agents there is a primary and secondary reaction. All of the effects must be given consideration in the treatment as each has an important bearing on the ultimate result.

The author is opposed to operation on malignant growths immediately after pre-operative radiotherapy. The objections cited to this procedure are that: (1) one series of radiations is not sufficient for a lethal dose for all the cancer cells of a deep-seated growth; (2) the blood vessels are primarily dilated and the tissues bleed freely, are more susceptible to infection, and will not heal well; and (3) the lymphocytes are much diminished and consequently the patient's general resistance is greatly reduced. After two weeks the skin has passed through the primary irritation and is in better condition for healing, the lymphocytes have recovered, and the patient's resistance is improved. The blood vessels and lymph spaces are beginning to contract and fibrosis has begun. Consequently there is perhaps less hæmorrhage than under normal conditions. If several series of treatments are given

and followed by a three weeks' interval, the latter result is quite marked.

In conclusion the author states that the successful use of the X-ray or radium in cancer depends upon the following principles:

1. The dose must be a maximum dose that is safe for the life of the overlying and adjacent normal skin and the underlying important structures, but destructive to the less resistant malignant cell. This dose is difficult to determine. It varies with the type of patient treated and the type, location, extent, and depth of the growth. It is given through several ports in such a manner that the deeper parts are cross-fired by the ray. Such a dose is called a "series dose"
2. The series dose must be given at intervals of twenty-four hours or more until complete, in order to avoid too severe intoxication from proteid absorption.
3. The series dose must not be repeated until the skin and the blood have recovered from the effects of the previous series, i.e., from two to four weeks when the X-ray is used, and from four to six weeks when radium is used.
4. Operation should not be done after X-ray or radium therapy until the local sound tissues and the blood have recovered from the primary action of the rays, i.e., from two to four weeks.
5. Several series of X-ray treatments previous to operation and extending over several weeks are better in the average case than one series of treatments. There is no necessity for a hasty operation in the average case of cancer. Time spent in X-ray or radium treatment before operation is not lost, but may mean the saving of a life in comparative comfort for a much greater period than if the operation were done first.
6. When it is possible to employ electrocoagulation in operation it often prevents recurrence for many months or years. It should be used much more frequently in operations on cancer.
7. Postoperative treatment should be continued for several months.
8. When thorough pre- and postoperative radiotherapy in cancer is used a much more conservative operation may be done, the neighboring lymphatics being treated by radiotherapy. ADOLPH HARTUNG.

**Witherbee, W. D., and Remer, J.: Filtered X-Ray Dosage.** *N. York M. J.*, 1920, cxi, 1105.

The barrier to a full destructive dose of the roentgen ray in a deeply seated tumor is the toleration of the skin covering the part. This fact led to the adoption of the cross-fire method of treatment in which a filter is used. Experiments made by the authors with skin and pastille as regards the dosage of rays filtered through aluminum showed that the filtered rays produced only about double the amount of action at half distance instead of four times as when the rays are unfiltered. This is contrary to any known law of physics regarding light and the authors have no explanation to offer for it. Experi-



ments were made also to show the effect of aluminum filters of different thicknesses (from  $\frac{1}{4}$  to 7 mm.) and the effect of spark gaps varying from 6 to 10 in. when a 3 mm. aluminum filter is used. Formulæ and methods for determining dosage are also given in this article.

The difference in the effects produced by the filtered and unfiltered rays in deep therapy and the employment of filtered instead of unfiltered rays are due to the fact that the filtered ray gives only double the dose at half distance instead of four times the dose. It might be assumed that if the skin were at half distance in filtered exposure and the tumor at full distance, the skin could tolerate two skin units without injury and the tumor would receive at the same time one and a quarter skin units, whereas in the unfiltered treatment the skin would tolerate one skin unit without injury and the tumor would receive at the same time one-quarter skin unit if filtration of intervening tissue were eliminated. Thus the tumor would receive five times the effect with filtered dosage that it would with unfiltered dosage as exemplified by filtered readings of half and full distance. If this were true, the results of deep therapy and direct action would be more encouraging. However, instead of five times the dose with the filtered ray as compared with the unfiltered ray the tumor receives biologically and according to formula determinations, just double the effect.

ADOLPH HARTUNG.

**Stevenson, W. C.: The Effects of Radium Treatment on War Injuries in the Neighborhood of Nerves.** *Brit. M. J.*, 1920, i, 862.

In suitable doses radium is not injurious to nerve tissues as has been shown by the marked improvement following its use in the treatment of syringomyelia. The author presents twelve cases of war injuries near and involving nerves in which radium was used. Beneficial effects were noted in all except a case of painful neuroma.

The sudden improvement in nerve function following the application of radium is probably due to the stimulation of normal functional activity in nerve tissue by the radium, either by softening the scar tissue around it or by some action on the nerve cells themselves which possibly improves their nutrition. In some cases radiation appears to lessen hyperactivity in a nerve which is being irritated by scar tissue.

The improvement noted in the cases presented is evidence that radium is of value in certain types of nerve trauma and in certain stages of the repair of nerve injuries. The author's conclusions are as follows:

1. Radium treatment cannot benefit gross nerve lesions.
2. Following a nerve operation and after milder degrees of nerve trauma radium seems to aid and to hasten the return of function in a limb.
3. Radium improves the nutrition in the area supplied by injured nerves.

4. It may be of value as an aid to diagnosis.
5. It is a valuable adjunct to other forms of treatment.

W. O. OTT.

**Boggs, R. H.: The Lethal Dose of Radium in Malignancy.** *N. York M. J.*, 1920, cxi, 1013.

Malignancy should be regarded as a specialty in itself rather than as a side issue as it is at present by most surgeons and most of those applying radium. Radiography is a difficult and complex problem. A comprehensive study of the agent and of the malignancy has resulted in the determination of the lethal dose of radium to a degree of precision undreamed of a few years ago. Advanced methods of treatment have followed which in selected cases have superseded surgery as a means of effecting a cure and, when used in combination with surgery, before and after operation, have increased the operability, lowered the mortality, and increased the percentage of cures. By these methods also palliation is obtained in hopeless cases.

Ante-operative raying is being advocated and may be even more valuable than raying after operation. The results of radium treatment in malignancy depend upon whether a lethal dose is given. The lethal dose varies with the susceptibility of the malignant tissue to radiation and its depth from the surface. In calculating the filtration and the number of ports of entry or amounts of cross-firing necessary to give a lethal dose to metastatic lymph glands, not only the situation of the glands most apt to show metastases, but their depth and the density of the overlying structures must be known. A study must be made of the lethal and the erythema dose, and the depth from the skin at which certain types of malignant tissue may be destroyed must be determined. In addition to its direct action on malignant tissue radiation has an indirect effect on malignant cells by the formation of fibrosis which begins after three or four weeks.

In all malignant lesions except rodent ulcer both the local growth and the adjacent lymphatics should be treated by radiation. The burying of radium is a step in advance over surface application.

The author discusses the principles of treatment in regard to rodent ulcer and malignant growths of the mouth, throat, breast, and cervix.

W. H. NADLER.

**Lawrence, H.: Cross-Fire Radium and X-Ray Therapy for Inoperable Malignant Disease.** *Med. J. Australia*, 1920, i, 458.

This article is essentially the report of a case in which cross-fire radium and roentgen therapy applied to a growth resembling sarcoma in the region of the left tonsil resulted in marked improvement. By means of radium tubes placed in the nasopharynx and mouth and below the angle of the jaw some 3,500 to 4,000 milligram-hours of treatment were given during the first four days. This was followed by roentgentherapy with the hard rays from a Coolidge tube. Subsequently several similar treat-



ments were given at intervals of ten days or two weeks. In about three months practically all evidence of the growth had disappeared. Recurrences developed later but improved under similar therapy.

About three years after the first treatment the patient developed what apparently was a recurrence of the growth at the base of the brain. The skull was trephined in the left temporal region and tubes of radium were placed under the opening for twenty-four hours and then on the scalp surfaces corresponding to the trephined area for twenty-four hours. At the same time cross-firing was done by means of tubes of radium in the mouth and nasopharynx and over the frontal region on the left side. In all, approximately 4,500 milligram-hours of treatment were given. Within a week there was marked improvement and after three weeks practically all the symptoms had disappeared. Several months later the patient was still well.

Following this report the author discusses cross-fire radiation briefly. He has found by experiments upon insects that cross-fire radium radiation (medium hard  $\beta$  ray predominating) is very destructive. This variety of radiation, however, is not often practicable in the treatment of disease, especially with the radium applicators in general use, but might be given by using needles with radium emanation and passing them close and parallel to one another into the growth to be treated. However, a cross-fire with a radium radiation (medium hard  $\beta$  rays predominating) and a well-filtered radium radiation (practically  $\gamma$  rays only) may be applied frequently. The author often uses a cross-fire consisting of a radium radiation, medium hard or hard  $\beta$  rays predominating, and well-filtered hard X-rays from a Coolidge tube. ADOLPH HARTUNG.

### LEGAL MEDICINE

**Admissibility of Evidence Touching Mental Capacity—Imbecility.** *State vs. Kelsie (Vt.), 108 Atl. R., p. 391.*

A physician was called as a witness for the defense in a murder case. After being qualified as an expert in mental diseases, he showed the examinations, observations, and tests to which the defendant was subjected and testified that the defendant, who was then about 34 years of age, had the mental capacity of a child of only 8 years of age. The witness was then asked several questions, the apparent answer to which would have been that the defendant was an imbecile. Each of these questions, however, was ruled out and the witness was not permitted to answer.

Because these questions were ruled out the defendant claimed that an error was made in the trial. The reviewing court held, however, that the answer would have added nothing to the testimony of the physician as given. By the evidence the defendant had created a doubt as to his capacity to commit a crime and had made a question of fact which could

be passed upon only by the jury. If the physician had been permitted to add that he regarded the defendant as an imbecile, the statement would not have assisted the jury further in fixing the defendant's mentality.

The term "imbecile" has no fixed meaning in law, and the statement that the defendant was an imbecile would have required further definition inasmuch as there are grades of imbecility and in the matter of criminal responsibility the law makes no distinction between imbecility and insanity. The test of the law is summarized by the following question: As applied to the act in question, did the accused have the mental capacity to understand the character, consequences, and quality of the act and the power successfully to resist the impulse to do it?

J. A. CASTAGNINO.

**Cold and Fever Constitute a "Disease."** *Sovereign Camp of the Woodmen of the World vs. Treanor (Texas), 217 S. W. R., p. 204.*

In an application for insurance in an insurance society the applicant answered, "No," to the question, "Have you ever consulted or been attended by a physician for any disease or injury during the past five years?" During that period the applicant had visited a physician and been attended for a "cold and fever." The decision in this case therefore depended entirely upon the definition of the word "disease."

It was held that the word "disease" comprehends a cold and fever. Webster defines the word as a "morbid condition of the body; sickness," and as synonyms gives "disorder," "malady," and "distemper." Since the applicant was sick enough to remain at home and to consult and be attended by a physician, he had a disease within the legal meaning of the word.

J. A. CASTAGNINO.

**Opinion Evidence as Against Positive Testimony.** *Finke vs. Hess, Wisconsin Supreme Court, 174 N. E., p. 466.*

A physician performed a mastoid operation which was followed shortly by paralysis of the face. It was contended by the patient that the seventh or facial nerve was severed in the operation, which, if true, would have constituted a cause of action against the physician. The physician testified positively that he had not severed the facial nerve. The evidence in behalf of the physician showed that the paralysis might have been due to a number of causes other than the severing of this nerve. Another physician testified as an expert for the patient to the effect that the paralysis could be caused only by the severing of the facial nerve.

The patient therefore offered no evidence except a physician's opinion that the nerve had been injured and the court held that this opinion would not offset the positive undisputed testimony of the physician who operated that he did not tamper with the nerve. Judgment was therefore rendered in favor of the defendant.

J. A. CASTAGNINO.



**Insufficient Evidence of Malpractice—*Sherwood vs. Babcock* (Mich.), 175 N. W. R., p. 470.**

Babcock, a physician, was called to treat a child at the home of Sherwood. He diagnosed the case as pneumonia. During the last stages of the illness meningitis developed from which the child died May 16, 1917. The physician's report showed the cause of death to have been meningitis with pneumonia as a contributory factor. At the time this child died a second child was taken ill. Death followed in this case May 30. Babcock reported the cause of death as typhoid fever. Later in May two other children in the same house became ill and the physician diagnosed both cases as typhoid fever. These children recovered, but while they were convalescing Babcock was dismissed and another physician was called.

Sherwood then sued Dr. Babcock for malpractice, alleging that he was negligent in making a wrong diagnosis and in not segregating the other children from the first child who was taken ill. According to the second physician the children had cerebrospinal meningitis. The lower court gave judgment in favor of Sherwood to the extent of \$1,000.

The upper court held, however, that there was not sufficient evidence to make a case of malpractice. The second physician had never seen the first child who was taken ill and had been called in after the death of the second child. All the evidence showed that the first child did not have cerebrospinal meningitis but simple meningitis. Two physicians called in for consultation during the illness of the other children testified that they were suffering from typhoid fever. The upper court therefore held that the verdict and judgment of the lower court was contrary to the weight of the evidence.

J. A. CASTAGNINO.

**Care Required in Selecting and Retaining Physician. *Woody vs. Carolina Spruce Co.* (N. C.), 101 S. E. R., p. 258.**

The Carolina Spruce Company employed a physician to treat its employees and paid him by sums collected monthly from the employees. In this case the court stated that under the law the company owed no legal duty to its employees to employ a physician for them, but when it assumed to do so and deducted a sum from their wages for medical attention it was under obligation to use due care in selecting a physician and in continuing to keep him in its service. Also that if, after the company had notice of the physician's unskillfulness and incompetence, it continued to employ him it would be liable for negligence in so doing.

The plaintiff was an employee who had suffered a fracture. As there was no other physician immediately available, it was necessary for him to take the service offered him or go without medical treatment. The plaintiff contended that in attempting to set the fracture the physician was so careless and unskillful that his injuries were aggravated.

J. A. CASTAGNINO.

**Physical Examination by Physicians in Negligence Cases in New York. *Herbert vs. Brooklyn Heights R. Co.*, 177 N. Y. Supp., p. 901.**

The question before the court was whether or not the lower court erred in entering an order directing the plaintiff to submit to a physical examination and directing the physician to report the findings of this examination to the defendant.

The upper court held that in personal injury cases the court may direct the plaintiff to submit to a physical examination in order that a physician may be qualified to testify as an expert witness concerning the plaintiff's condition. It held further that the physician might disclose the results of the examination to the defendant but that the court has no power to direct him to make such a report. The order of the lower court was modified so as to exclude the direction to the physician to make a report to the defendant.

J. A. CASTAGNINO.

**Parents' Refusal of Operation—Repetition of Visits—General and Special Employment of Physician. *Nelson vs. Farrish*, Minnesota Supreme Court, 173 N. W., p. 715.**

Two physicians were sued for alleged malpractice in a case of osteomyelitis of the radius. The patient, a girl 8 years of age, was treated by the first physician for a period of three weeks. The second physician, who practiced in another city, was called during the time the first physician was treating the case, examined the arm, and gave directions as to treatment. A few days later he was called again and attended the patient in the presence of the first physician. The first physician continued to treat the arm for some days afterward. Later the child was taken to a hospital by the second physician and an operation was performed. The employment of the second physician terminated at that time. In about a month another operation was performed at which it was found necessary to remove the radius.

In the action for malpractice it was claimed that if the physicians had advised the parents of the nature of the case and the necessity for a prompt operation the arm would have been saved. It was conceded by all that the proper treatment for osteomyelitis is operation in which the shaft of the bone is opened, the pus drained, and diseased tissue removed. The physicians contended, however, that they advised the parents of the nature of the ailment and the importance of an immediate surgical operation, but that the parents would not consent to such an operation.

Another question which arose in this suit was which physician was acting in a general capacity and which as a consultant. The difference between general and special employment relates principally to the obligation of the physician to continue his attendance. If called generally, he must give such continued attention and attendance as the patient's condition requires. If called specially and only for the occasion, it is not his duty to repeat his visits

or continue his treatment. The testimony in the case disclosed the fact that the second physician was not expected to return unless called, and that therefore it was not his duty to return. Accordingly he could be held liable only for his two visits and could not be held responsible for what the first physician did.

On the question of fact presented in the case the finding was with both physicians and was affirmed in the supreme court. J. A. CASTAGNINO.

**The Effect of a Blow While Working under Extreme Heat.** *Murray City vs. Industrial Commission, Utah Supreme Court, 183 Pac. R., p. 331.*

While loading slag on a wagon Hazeldine, an employee of Murray City, received a slight blow in the back of the neck from the handle of a shovel with which a teamster was leveling the slag. Paralysis followed and he was disabled for some time. Subsequently he filed a claim with the Industrial Commission against the city and the commission ordered the city to pay him \$8.73 a day for the period of his disability. At the hearing before the commission evidence was introduced by the city to show that there was no wound or bruise on the neck of the injured man, not even an abrasion of the skin. Further evidence was introduced to show that he was suffering from high blood pressure, that the day he was injured it was very warm, and that the paralytic stroke was due to high blood pressure and the weather rather than to the blow from the shovel.

The circuit court reversed the finding of the commission and vacated the award. The commission appealed. The upper court held that the paralytic stroke was due to high blood pressure and the intense heat of the day but that the blow from the shovel and the fright caused by it were the proximate causes. The finding of the commission was therefore affirmed and the order of the circuit court was reversed. J. A. CASTAGNINO.

**Death by Disease Accelerated by Accident Does Not Warrant Recovery on Accident Policy.** *Leland vs. Order of United Commercial Travelers, Mass. Supreme Court, 124, N. E., p. 517.*

In this case it appeared that Leland, who held an accident insurance policy, was suffering from a seriously diseased condition of the heart or lungs or both. While going from the cellar to an upper floor the insured fell and the two causes, the disease condition and the fall, operating together, produced fatal results. From one point of view the death

seemed to have been due to the accident, but from another it was not. The fall alone would not have been fatal if the insured had been in a normal condition. On the other hand, if it were necessary to prove in each instance that the same accident would have had the same result if it occurred to a normal person, many who are merely not strong, whose powers of resistance are easily overcome, or who have diseases in the early stages would be deprived of protection by accident insurance policies. Therefore it is the rule not to regard the insured as suffering from disease.

In this instance the insured was suffering from a disease that actively co-operated with the fall in causing death. Death probably would not have occurred that day without the fall, but both were so concurrent that neither alone could be determined as the cause of death. Either alone, without the other, would not have been fatal, and it could not be told whether the deceased died from the disease or from the fall. Within the meaning of the accident policy, therefore, death did not result "alone and independent of all other causes." J. A. CASTAGNINO.

**Who Must Make Required Inquiry Before Corpses May Be Used for Dissection?** *Burke et al. vs. New York University (N. Y.), 179 N. Y. Supp., p. 626.*

The plaintiffs brought suit against New York University to recover damages for injury to their feelings due to the act of the University, through its medical department, in dissecting the body of their father. The body had been taken to the morgue from a hospital and was delivered to the University from the morgue.

The Public Health Law of New York, in common with numerous other state laws, permits the morgue to deliver any corpse in their possession, not placed there by relatives or friends, to medical institutions similar to the New York University. The persons in control of the morgue, however, are required to make reasonable inquiry as to the friends or relatives of the deceased. In this case the morgue evidently failed to make sufficient inquiry. The question presented was, therefore, whether the fact that the officials of the morgue failed in their duty would be sufficient to make the University responsible for the injuries sustained. The law did not require the University to make an inquiry. Accordingly the court held that since it was the duty of those in control of the morgue to make the inquiry as to the friends or relatives of the deceased, and as the law did not intend duplication of inquiry, the University was not responsible. J. A. CASTAGNINO.



# GYNECOLOGY

## UTERUS

**Coventry, W. A.: Prolapse of the Uterus.** *Minnesota Med.*, 1920, iii, 286.

Coventry reports 50 cases of prolapse of the uterus on which he operated in the last six years. The cure in these cases was not only anatomical but also symptomatic. Six of the patients were between 60 and 70 years of age; 17, between 50 and 60; 18, between 40 and 50; 7, between 30 and 40; and 2, between 20 and 30. One patient was a nullipara.

For prolapse of the first degree the author prefers the Webster-Baldy operation, but for that of the second and third degree he does either a Watkins-Wertheim or a Mayo operation. He emphasizes the importance of a perineorrhaphy in all of these procedures.

One of the complications which followed operation was cystitis due to the use of a catheter, a previous infection, or a folding of the bladder which caused the formation of residual urine. Bladder pockets were the source of much trouble. In one case in which the condition was of two years' standing relief was given by the irrigation of the bladder and the use of argyrol. One patient who had been supposedly sterilized by resection of the uterine horns became pregnant. Cesarean section was necessary at the seventh month and the baby lived only three hours. In two cases there was dyspareunia.

Coventry advocates vaginal operations because they are associated with less risk and are followed by good results.

EUGENE CARY.

**Curtis, A. H.: Chronic Leucorrhœa; Its Pathology and Treatment.** *J. Am. M. Ass.*, 1920, lxxiv, 1706.

In a previous study of the endometrium from 118 uteri removed to remedy various pathologic conditions, Curtis found that chronic infection of the uterus above the level of the cervix is infrequent. When such infection persists it is usually a complication of salpingitis or cervicitis.

Many years of investigation of the pathology of chronic leucorrhœa has led to the conclusion that chronic discharges arise chiefly from the uterine cervix and Skene's ducts. The essential cervical lesion consists in an overgrowth of hypersecreting infected glands. Associated formation of cervical granulations and strictures is of frequent occurrence.

The treatment consists of: (1) the correction of the complicating gross pathologic lesions, (2) the destruction of Skene's ducts, (3) thorough dilatation of the cervix, and (4) radium applications to the cervix.

The destruction of Skene's ducts (two channels, each 1 cm. long, located beneath the urethra and

opening one on either side of the floor of the meatus) is accomplished as follows:

The blunt end of a needle, held in a forceps, is threaded into the duct lumen, and its end is forced through the base of the duct so that the needle head protrudes into the vagina. The duct is split with a knife and the tract fulgurated.

The most usual focus and the most difficult to eradicate lies in the endocervix. After thorough dilatation, two 25 mg. tubes of radium, each screened with a thin capsule of  $\frac{1}{2}$  mm. gold, are placed in tandem in a sheath of dental rubber and introduced into the cervix. The radium is held by a suture passed through the external os. Application is made for a period of from six to nine hours. The discharge is thereafter more profuse for three or four weeks, but then decreases. One or more subsequent radium treatments may be required; if so, a period of ten or twelve weeks should intervene between applications, and later treatments should be given for shorter periods of time.

Of 46 patients, 36 are available for study. Twenty-six recovered, 7 were greatly improved, and 3 were not materially benefited. The prognosis is least favorable in cases with widespread pelvic infection or lesions requiring surgical correction. In nearly all others the condition may be cured.

**Graves, W. P.: Some Immediate After-Effects in the Use of Radium for Non-Malignant Uterine Bleeding.** *N. York M. J.*, 1920, cxi, 969.

The value of radium in the treatment of non-malignant uterine bleeding has been thoroughly established. The author's purpose in this article is to call attention to certain disagreeable sequelæ of intra-uterine radiation which have not been given sufficient attention. These include nausea, bleeding, leucorrhœa, pain, renal and nerve symptoms.

In Graves' experience nausea has been more severe following the use of radium than following a simple examination and curettage under ether. While in many cases it is immediately relieved when the radium is removed, in some cases it persists much longer. Apparently it is not due to the presence of the foreign body in the uterus as it does not occur to the same degree following the insertion of a stem pessary or gauze packing.

Bleeding may continue or reappear after the removal of the radium and persist for days or weeks. When the treatment has been given for menorrhagia the next period or two may show no diminution or may be increased. The ultimate result, however, is nearly always satisfactory.

Leucorrhœa, which is often irritating and offensive, requires treatment by cleansing douches.

A slight nagging pain on the left side develops in some cases but subsides in a few days. In rare instances there is uterine colic due to the reaction of the uterus to the foreign body. Severe adnexal pain is the forerunner of serious inflammation due to the lighting up, by the radium, of an old salpingitis. The use of radium within the uterus in the presence of an old pelvic inflammation is exceedingly dangerous.

Renal symptoms observed after the use of radium demand caution in the treatment.

Nervous symptoms ordinarily occur in about the same proportion as after hysterectomy. In several of the author's cases there was a rather protracted period of physical depression not to be accounted for by the operation or the patient's previous health. It is conceivable that when the nervous system is unstable radium may exert a profound influence on the whole organism. Nervous symptoms have been observed only following intra-uterine radiation.

In conclusion the author states that in discussing these unfavorable symptoms he does not intend to depreciate the benefits of radium, but desires to emphasize the fact that it is a powerful and dangerous agent and that in certain cases which are not always recognizable its use is attended with the gravest risk.

S. A. CHALFANT.

**Detré, C.: The Scientific Basis and the Technique of the Radiotherapy of Uterine Fibromyomata** (Les bases scientifiques et la technique de la radiothérapie des fibromyomes utérins). *Gynéc. et obst.*, 1920, i, 181.

Detré believes that in the future the fractional dosage of X-rays rather than the *therapia sterilisans magna* advocated by certain German radiologists will be the method of choice in radiotherapy. Newly formed tissue is more easily affected by the rays than normal tissue and in fibromyomata such tissue is directly influenced, the more superficial layers absorbing most of the rays and becoming atrophied.

Dosage is the basis of radiotherapy, and the efficacy and action of radiation are dependent upon it. The use of moderate and repeated doses preserves the skin and normal tissues, while frequent regular periods of treatment make possible a more careful supervision of the patient than massive doses.

Detré believes that in the X-ray treatment of fibromyomata it is not necessary to bring on the menopause or to cause ovarian sterilization. The most recent evidence is that myomata may be reduced in size considerably by the direct action of the X-rays long before the menopause is induced.

W. A. BRENNAN.

**Mornard, P.: Radiotherapy of Uterine Fibromyomata** (Sur le traitement radio-thérapique des fibromyomes de l'utérus). *Rev. de chir.*, Par., 1920, lviii, 244.

Mornard reviews the recent literature on the results of radiological treatment of uterine fibromyomata. In his opinion it has been demonstrated

definitely that the X-ray has a direct destructive action on such tumors, especially when they are exclusively fibrous; that it has a certain action on the uterine mucosa and ovary; that it may destroy the graafian follicles; that, perhaps to a lesser degree, it acts also on the glands of internal secretion; and that it may induce the menopause. It is evident also, however, that its action on the fibroma itself is sufficient to cause regression of the tumor and that such tumors may be cured without interference with the ovaries.

While in many cases radiotherapy will arrest hæmorrhage, in the great majority this result is obtained by the induction of the menopause. The ultimate effect on the tumor is much less complete. The growth rarely disappears but frequently becomes more or less decreased in size. In cases of cancer the rays do not cause the degeneration but it is possible that they excite the neoplastic cells or diminish the resistance of the fibrous tissue surrounding a cancer and thus predispose a pre-existing neoplasm to degeneration. Radiotherapy should be rejected both in cases of malignant degeneration and cases in which such degeneration is suspected.

The technique of radiotherapeutic treatment has not been definitely established and as yet no satisfactory method of protecting the ovaries has been devised. Whether radium should be used alone or in conjunction with the X-ray is a question that is still unanswered.

Mornard concludes that, when indicated, radiotherapy is capable of effecting a cure in the great majority of cases of fibromyomata of the uterus. During the treatment the patient must be kept under close observation in order that any degenerative processes may be discovered immediately.

W. A. BRENNAN.

**Baisch, K.: The Results of Radium Treatment of Carcinoma of the Uterus** (Erfolge der Radiumbehandlung des Uteruscarcinoms). *Strahlentherapie*, 1920, x, 36.

In 66 cases of genital cancers treated with radium and mesothorium in 1914 there were 42 cancers of the cervix. Seven of these patients are still alive (16 per cent, the same percentage as following operation).

Baisch classifies these cases into the following groups: (1) beginning cancer of the cervix, 3 cases; (2) advanced cancer of the cervix without involvement of the vagina and parametrium, 12 cases (complete cures were obtained in only 2, and a rectovaginal fistula developed in 1); (3) cancer infiltrating the parametrium but still operable, 5 cases (1 complete cure; 20 per cent); and entirely inoperable cancers, 21 cases (2 cures; 10 per cent).

From 50 to 100 mg. of radium in a brass capsule covered with rubber were applied for twenty-four hours at intervals of three or four weeks. As a rule the treatment consisted of three or four sessions. Because of the development of many rectovaginal



fistulæ at first, the use of 1 cm. of wax to protect the rectum was begun later and since then only 1 recto-vaginal fistula has developed in 360 cases treated.

The author recommends radium treatment alone only in beginning and inoperable cases of carcinoma of the uterus. All others should be operated upon and given three series of radium and X-ray treatments postoperatively. JUENGLING (Z).

**Kehrer, E., and Lahm, W.: The Limitations of Radium Treatment of Cancer of the Cervix** (Ueber die Grenzen der Radiumtherapie des Collumcarcinoms). *Strahlentherapie*, 1920, x, 3.

Intensive radium treatment may cure definitely inoperable cancer of the cervix in the pathologic sense and even cancer nests far from the primary focus and close to the pelvic wall. In numerous examinations the authors studied the difference between the normal retrogression of unrayed cancers, the histologic changes due to radium treatment, and the penetrating action of radium. Their investigations proved that in addition to the retrogression the radium caused also certain injuries to the epithelial cells in neighboring organs.

On the basis of these findings they state that in intensive raying it is more difficult to prevent infection than to obtain retrogression of the cancer cells. Such infection (of the bladder, sigmoid, or uterus) occurring during intensive raying makes it necessary to stop the treatment at once. Successful treatment therefore must avoid overdosing. This is best accomplished by avoiding the fairly constant necrosis dose for the rectum by increasing the radiosensibility of the cancer cells. HARMS (Z).

**Faure, J. L.: Abdominal Hysterectomy** (L'hystérectomie abdominale). *An. Fac. de med. Univ. de Montevideo*, 1919, iv, 747.

Faure describes a subtotal hysterectomy in which the cervix is sectioned at the isthmus and left in place and the vagina is unopened. In some cases, however, the cervical region cannot be reached easily and it is impossible to perform a subtotal hysterectomy in this way.

The method which Faure has used for the past twenty years for the treatment of cases in which the uterus is very mobile is that of posterior detachment. Kelly's method of continuous transverse incision is also applicable to this type of case and is of value especially when it is possible to approach the uterus from only one side.

When both sides of the uterus are fixed by adhesions to the pelvic walls and the uterus cannot be approached from above, either on the right or the left side, section on the median line as far as the isthmus is the only feasible method. Each half of the uterine isthmus is then sectioned separately and removed with its adnexa.

If this method is impossible and Kelly's technique is also barred, there still remains anterior detachment. By this procedure the anterior surface of the uterus is exposed by uterine retroflexion and the cervix is

grasped with the forceps a little above the isthmus and sectioned. The adnexa may then be reached and separated from the pelvic walls by section of the utero-ovarian pedicle.

Anterior detachment, which was devised by Faure, should be limited to cases of bilateral adhesive adnexitis with irreducible uterine retroflexion. In other cases uterine hemisection or Kelly's method is to be preferred. W. A. BRENNAN.

## EXTERNAL GENITALIA

**Bouquet, H.: Voluminous Tumors of the Vulva** (Tumeurs volumineuses de la vulve). *Gynéc. et obst.*, 1920, i, 149.

The author reports 2 cases of voluminous tumors of the vulva. In the first case, that of a young woman 20 years of age, the tumor developed in the left labium majorum and weighed 2,300 gr. It was composed of soft gelatinous and cedematous tissue and on histologic examination showed the usual lesion of elephantiasis.

The second case was a case of hydrocele of ten years' duration. The tumor developed in the right labium majorum and the inguinal region and was formed of a series of cystic intercommunicating pockets which contained yellow fluid. It was removed by incising the oblique muscle as in the radical operation for hernia. Two prolongations were found, one subcutaneous in the inguinal region, and the other parallel to the first but beneath the aponeurosis.

The surgical removal of these tumors was not difficult and hæmostasis was obtained easily because such growths are not very vascular. Both of the patients recovered. W. A. BRENNAN.

**Wachs, C., and Mazer, C.: Gonorrhœal Vaginitis in Children.** *N. York M. J.*, 1920, cxi, 997.

This article is a preliminary report giving the results of the treatment of 48 cases of gonorrhœal vaginitis with Dakin's oil. The authors state that the condition is very common in children and tends to become chronic. It was found in 4 per cent of all patients admitted to the Babies' Hospital in New York City.

Early in 1919 the authors tried Hirst's silver paste but had little success with it and later turned to Dakin's oil. A 1 per cent solution of the oil, freshly prepared, was used. The technique of the treatment is described as follows:

The child is placed in a partial Trendelenburg position, the vulva are cleansed with boric acid solution, and the vagina is filled with the oil by means of a medicine dropper. When the dropper is withdrawn the labia are compressed for a few minutes so that the vaginal mucous membrane is thoroughly covered with the oil. After use the medicine dropper is boiled and dried with ether. The treatment is given every other day at the clinic and the mother is instructed to continue it at home.



The patients thus treated showed marked improvement, both clinical and bacteriological, within a month. Smears were taken every two weeks. In 25 cases the treatment was discontinued at the end of three months and the patients were told to report for examination every other week. At the end of four months 39 patients had been discharged. In the 6 cases remaining pus cells and many bacteria were found on microscopic examination although there was marked clinical improvement. These patients were given douches of the standard Dakin's solution, one-quarter strength, and the mother was instructed to continue the oil treatments at home.

Other conditions, such as thread worms and foreign bodies, may cause vaginal discharge and should be excluded before treatment is given for gonorrhœal vaginitis.

Thirty-nine of the 48 cases reported were cured. There were 3 recurrences. The authors advise observation at regular intervals for seven or eight months.

EUGENE CARY.

### MISCELLANEOUS

**Bell, W. B.: The Correlation of Function: with Special Reference to the Organs of Internal Secretion and the Reproductive System.**  
*Brit. M. J.*, 1920, i, 787.

The ductless glands are not only responsible for disorders of the reproductive system and the metabolic state but are concerned also in the control of the emotions, that is, of the mind. A malfunction of the organs of internal secretion is reflected in the mind, in the body, and in the reproductive system; the function and order of all are linked together.

Hyperplasia or neoplasia of the suprarenal cortex or of the anterior lobe of the pituitary body may induce masculinity in women. The voice becomes heavier, the skin coarse, and the metabolism somewhat reduced. In such women the suspension of the menstrual function is simply a part of the general masculinity and is not due to the lesion in the pituitary body *per se*. In fact, hyperplastic conditions of the anterior lobe stimulate activity in the genitalia. In the male acromegaly is associated with increased sexuality where's destructive lesions of the pituitary body produce impotence and at times a change toward femininity.

Following child-bearing the pituitary body becomes distinctly larger and in multiparous women the average size of the gland is greater than in men. The ovary exerts its influence on metabolism during the reproductive period. The intra-uterine foetus or the child at the breast necessitate increased metabolic effort, and the ovary is concerned in regulating the other organs of internal secretion and the resulting metabolic rate.

The disturbances of the menopause are due probably to a general upset of the internal secretory system. Removal of the ovaries in animals produces changes in the other ductless glands, especially the pituitary and thyroid glands. Many women

give evidence of a lack of thyroid secretion following the menopause. This is shown by depression and melancholia.

The author never removes the ovaries unless they are definitely diseased, and he emphasizes the necessity of leaving at least a portion of an ovary or a transplant in order to conserve the general tone of the secretory system.

Adiposity is generally present when the pituitary is inactive. The author found that severance of the blood supply to the pituitary gland in animals induced somnolence, obesity, and total atrophy of the genitals. The syndrome of dystrophia adiposogenitalis may be brought on not only by a growth in the pituitary fossa but also by a suprasellar tumor which causes pressure on the stalk and the glandular blood supply.

Thyroidectomy is followed by definite changes in the other ductless glands, these being most marked in the pituitary gland which undergoes hyperplasia in all parts.

In cases of increased thyroid activity the author has found the X-ray of value. In cases of ovarian insufficiency it is necessary to administer both thyroid and ovarian extracts. Ovarian extract alone is useless. It is probable that the extract of one is necessary to activate that of the other. The correlation of the functions of the internal secretions is very well shown by the administration of thyroid to myxœdematous patients. "A melancholic, obese, non-menstruating, sterile woman becomes happy, is reduced in weight, menstruates, and may even conceive."

A. J. SCHOLL, JR.

**Mayo, W. J.: Conservation of the Menstrual Function.** *J. Am. M. Ass.*, 1920, lxxiv, 1685.

The surgeon approaches his work with the physical condition of the patient in view. He achieves a tangible success but occasionally is not rewarded by the patient's gratitude because of intangible changes in the nervous system following the operation. Physical cure is purchased at the price of nervous stability, and we talk wisely of neurasthenia, psychosis, neurosis, and hysteria. Often the same physical cure could have been obtained without creating the disturbance so troublesome to the patient, her family, and her friends.

The central nervous system has a short heredity; its characteristics are not fixed, but unstable, especially in some families. The nervous system in man weighs as much as the liver and has as many or even more possibilities of functional disturbance because it is less stable in its function. The only difference is that the bile itself can be seen while only the results of disturbed thoughts are visible. One group of physicians will say that all psychic disturbances have a physical basis, apparently believing that physical basis outside the central nervous system. They then very properly begin to hunt for the cause of these disturbances and often very improperly attempt to place the blame for



them on some real or fancied physical defect with which they have little or no connection.

The uterus, the ovaries, and the tubes have been the chief sufferers from misguided efforts at relief, efforts apparently based on the conception that woman's psychic disturbances are generated in her reproductive organs. In cases of benign neoplasms and inflammatory diseases, however, the patient's future condition, psychic as well as physical, should be borne in mind. Happiness is a state of mind, and a state of mind is not necessarily a state of body.

When abdominal surgery was in its infancy the ovaries and tubes were removed on slight indications. With the growth of knowledge this ceased, but in its place many miscalled conservative operations were devised. Instead of being removed, the ovary was subjected to unnecessary tinkering which it does not stand well. Frequently the patient developed sequelæ necessitating the removal of the ovaries later. The small cystic ovary especially has been the victim, not of the surgeon, but of the operator. Following the type of operation mentioned a group of patients return complaining of what they are told are adhesions, but without mechanical signs. Many patients have been operated upon and re-operated upon with only temporary success for adhesions which did not produce mechanical symptoms. The belief that adhesions which are located by the patient but cannot be located by the surgeon cause serious trouble has little foundation.

The internal secretion of the ovary is closely related to the endocrine system generally, and widespread effects are manifest on the cessation of the ovarian function.

Hysterectomy has become an operation so thoroughly organized that almost every operator has some special bit of technique he uses with it of which he is proud, and many a uterus is unnecessarily sacrificed when a myomectomy would be the better operation and would save both the menstrual function and the possibility of motherhood.

In many cases of myomatous disease it is not possible to save a uterus which will bear a child, but in cases otherwise suitable one ovary and enough of the endometrium may be saved to continue the menstrual function.

It has been argued against myomectomy that it is the more dangerous operation, but in a series of 741 cases at the Mayo Clinic the mortality was a shade under 1 per cent (0.9). Abdominal myomectomy was done in 617 of the 741 cases with 3 deaths (five-tenths of 1 per cent). There were 4 deaths in the 124 vaginal myomectomies (about 2.7 per cent). Every patient dying in the hospital, irrespective of the cause of death or the length of time which has elapsed since the operation, is counted as dying from operation. Following myomectomy in the 741 cases 35 women raised one child, 11 raised two or more children, and 15 were pregnant at the time the investigation was made. Twenty-three married women who were sterile before operation had one or more children after operation.

Because of the acute degeneration of myomatous tumors a number of pregnant women were subjected to myomectomy. All of the patients lived, and 85 per cent went on to term and were delivered of living children. It has been claimed that frequently tumors develop after myomectomy. Nineteen of these 741 patients (2.56 per cent) required secondary operations; in 11 cases the operation was done five or more years after the myomectomy, and in 1, thirteen years afterward. One of the 19 patients had a child after myomectomy. The majority of the secondary operations were performed for inflammatory disease. It was difficult to obtain accurate pathologic data of secondary operations since more than half of them were done elsewhere, but none of them revealed malignancy. In the cases in which the second operation was done for recurrence of fibroids the operation could be avoided today by the use of radium. In none of the cases reported were the recurring tumors large; the patients, having in mind their former condition, were on the alert. Usually a hysterectomy was performed as the patient had been carried along by the myomectomy to the age at which a radical operation is of less importance.

In selected cases radium must justly be considered a competitor of hysterectomy, but it has no competitive standing in cases suitable for myomectomy. When bleeding necessitates interference in the menopause period, radium has a remarkable field of usefulness. If the tumors are large, coming well up into the abdomen, and are caused to disappear by the use of radium, the menopause is brought about. Massive doses of radium usually destroy the function of the ovaries and uterus; the non-functioning organs are left to await an uncertain future. Non-operation and conservation must be differentiated.

Total hysterectomy is a wise procedure if it can be done safely as is usually the case. Leaving the cervix leaves an average cancer liability. After total hysterectomy the patient seldom complains of local trouble. If the cervix is left, however, a foul, irritating leucorrhœa sometimes results.

In conclusion the author reiterates that conservation of the menstrual function is of the utmost importance even if pregnancy is not possible, and that the surgeon who faces the necessity of removing the uterus or the ovaries and bringing about all the endocrine changes attending the procedure is assuming a serious responsibility. The patient's heredity is responsible for her nervous instability, but the operation may be the match which lights a fire in the ashes of which the patient finds herself unable to readjust her life to her living conditions.

**Clark, J. G.: The Relative Values of Radium and Surgery in the Treatment of Tumors of the Pelvic Organs.** *Ann. Surg.*, 1920, lxxi, 683.

Clark gives a very clear statement of the position occupied by radium as compared with surgery in the treatment of tumors of the pelvic organs.

Radium," he believes, may be considered "an adjunct of surgery and not its competitor."

In giving his experience based upon five years' use of radium, the author divides his work into that which relates to fibroids of the uterus, to "idiopathic bleeding uteri" with no apparent tumefaction within the uterus, and to cancer of the uterus. In the first class of cases 50 mg. are used as a rule and all uncomplicated tumors up to the size of a three-and-a-half to four months' pregnancy are radiated. Tumors larger than this should be removed by hysterectomy. The dose of 50 mg. may be repeated once or twice at intervals of four, five, or six weeks. Usually one treatment of 50 mg. for twenty-four hours will stop the bleeding within a period varying from a few days to four weeks.

Great care must be exercised in the selection of cases for radium treatment. There must be no acute or chronic pelvic inflammation and no cystic tumors of the ovaries. Radiation in the presence of an old chronic pelvic inflammation is a dangerous procedure.

In cases of idiopathic bleeding — menopause cases — radium works like a miracle. One treatment of 50 mg. for twenty-four hours checks the bleeding forthwith and is rarely followed by recurrence.

Of the author's series of 150 cases belonging to the groups mentioned 4 were not relieved of bleeding by radiation and were later treated by hysterectomy with no untoward complications.

Radium should be employed for young women less frequently than for women at or near the menopause as in the former a simple myomectomy or a subtotal hysterectomy, which leaves the

generative organs essentially normal, may be possible and the physiologic equilibrium after an operation is more stable. Also in the cases of young women radium must be used in much smaller doses than for older women or castration may result.

The author is especially enthusiastic regarding the use of radium in cases of cancer of the uterus, particularly in operable cancer. He and his associates have treated 209 cases of inoperable cancer with the following results:

Year	Dead	Not Traced	Living
1914	8	0	1
1915	19	1	4
1916	46	8	11
1917	33	3	23
1918	5	13	34
Totals	111	25	73

The author's conclusions may be summarized as follows:

1. Radium as a palliative remedy is the treatment *par excellence* in inoperable cancer of the cervix.

2. In inoperable cancer of the cervix radical operation should be done and followed immediately by postoperative radiation.

3. In cancer of the fundus uteri hysterectomy is indicated unless grave contra-indications to operation are present. When operation is contra-indicated radium should be used.

As yet, the author is not able to report any cures, but he ventures the belief that some of the patients will live at least five years. H. B. MATTHEWS.



# OBSTETRICS

## PREGNANCY AND ITS COMPLICATIONS

**Lewis, H. F.:** *The Diagnosis of Ectopic Pregnancy.* *Illinois M. J.*, 1920, xxxvii, 301.

The author discusses 183 cases of ectopic pregnancy observed at the Cook County Hospital, Chicago, Illinois, from December 6, 1912, to September 4, 1919. Fifteen of these he discards, believing the diagnoses incorrect or doubtful. Of the remaining 168 patients, 13 died, 11 were discharged improved, 4 were discharged in the same condition as on admission, and 140 recovered. Only 16 of the multiparæ gave a history of sterility for five years or more.

The period of gestation, which was estimated in 80 cases, was as follows: four weeks in 18, between four and twelve weeks in 43, from five to six months in 3, at term in 2. Sudden onset of abdominal pain occurred in less than half of the cases, colicky pains in the lower abdomen in a little more than one-third, and abdominal tenderness in four-fifths. Vaginal examination showed the uterus enlarged in nearly one-third, and a palpable mass, which was usually tender, was found in one of the fornices or the cul-de-sac in over two-thirds.

The temperature on admission was above 99 degrees in nearly three-fifths of the cases. Fever was more frequent and rose higher in those in which the internal hæmorrhage was greatest and was due apparently to the absorption of toxins from the blood deposits in the abdomen.

The most frequent error in diagnosis was acute or chronic tubal infection, and the next most frequent error abortion and acute appendicitis. The more severe the symptoms the more accurate was the diagnosis. Usually a carefully taken history and a physical examination will lead to a correct diagnosis even in cases of unruptured ectopic pregnancy.

S. A. CHALFANT.

**Gérard, M.:** *Nephrotomy in Eclamptic Anuria* (La néphrotomie dans l'anurie éclamptique). *J. urol. méd. et chir.*, 1920, ix, 97.

The author reports a case of total eclamptic anuria in which nephrotomy was done with a successful result. and compares the value of decapsulation and nephrotomy.

Gérard believes that most of the cases reported as eclamptic anuria in which there was spontaneous recovery were in reality cases of oliguria.

In France the indications for surgical intervention on the kidney in eclampsia are restricted, but the general view is that anuria justifies operation. Decapsulation, an operation done very frequently for eclampsia, has a mortality of about 38.8 per cent which is higher than that in cases treated medically.

It should be remembered, however, that only the most severe cases come to operation. In severe oliguria or anuria the mortality is much higher, mounting to over 50 per cent.

The author has been able to find only 4 cases in the literature in which nephrotomy was done for eclamptic anuria. Three of the 5 patients recovered. In Gérard's opinion, the favorable results of nephrotomy with drainage of the pelvis are very striking.

The anæsthetic of choice is nitrous oxide as ether and chloroform have an unfavorable effect on the already intoxicated organism. A unilateral operation is preferable because it can be done more quickly. In his own case the author did a nephrotomy with drainage of the pelvis and decapsulation on the right kidney. Drainage should be continued for about ten days or until the kidney function has become normal. It is very important to continue the medical treatment of the anuria after the operation.

The conclusions drawn by the author are as follows:

1. Surgical intervention should be resorted to in the treatment of eclamptic anuria after the usual methods, uterine evacuation or copious bleeding, have failed.

2. The operation of choice appears to be nephrotomy with pelvic drainage and decapsulation of the kidney.

3. When pronounced oliguria is associated with a poor general condition and signs of uræmia and when there is complete anuria the best results may be expected from early operation. The clinical aspect of the case will be the most reliable guide as to the time to operate.

W. A. BRENNAN.

**Davis, C. H.:** *The Nausea and Vomiting of Pregnancy.* *Wisconsin M. J.*, 1920, xviii, 514.

The author states that undoubtedly the metabolism is disturbed in every pregnancy. In the study of cases of the nausea and vomiting of pregnancy the causes given by text-books should be kept in mind and when found should be corrected as a part of the general treatment. Davis' plan of treatment includes: (1) a carefully taken history, (2) drainage of pus collections, (3) gynecological care to correct pathological conditions such as uterine displacements, cervical erosions, etc., (4) in severe cases, rest in bed and an anti-acid diet high in carbohydrates and low in fats and proteids, and (5) alkalization of the system by alkaline waters.

In the use of medication Davis has not noted any benefit following hypodermic injections of corpus luteum. Sodium bromide, however, has been found of value. Cases approaching the pernicious stage are sent to the hospital where they can be

given careful nursing. All food by mouth is stopped and 5 per cent glucose solution is given by rectum. In very serious cases 20 per cent glucose in triple distilled water is given intravenously. W. H. CARY.

**Weymeersch, A.: The Conservative Cæsarean Operation after Rupture of the Membranes** (L'opération césarienne conservatrice après la rupture de la poche des eaux). *Rev. franc. de gynéc. et d'obst.*, 1920, xv, 97.

Several times during recent years the author has had occasion to do a cæsarean operation after the membranes had ruptured. In such cases he chose the classical cæsarean section in preference to the extraperitoneal and suprapubic sections.

Schauta confined the use of the cæsarean section to thoroughly aseptic cases with intact ovum or with membranes only recently ruptured and not yet touched by the hands of the obstetrician. French surgeons generally exclude cases in which the membranes have ruptured.

The indications for the operation have been greatly extended, however, by Zarate and others. Zarate preserves the peritoneum and external surface of the uterus from contamination by the uterine contents. He surrounds the uterus with sterile compresses, incises through this covering, and inserts a Mikulicz drain between the sutured abdominal wall and the anterior uterine wall.

Weymeersch has employed this technique, omitting the drainage, in five cases. He makes a vertical incision and closes the wound in two planes with chromic catgut. The results in the five cases were not unfavorable. All of the women recovered, but two of the infants died. One of the deaths was due to prolapse of the cord and the other to ether narcosis. Both of the infants were alive at the time of operation.

In the author's opinion the conservative cæsarean section is applicable to all cases in which the membranes are ruptured. It is definitely contra-indicated by fever, evident lack of strict asepsis in the manipulations, and a long and exhaustive labor.

W. A. BRENNAN.

**Irving, F. C.: Cæsarean Section under Local Anæsthesia Combined with Morphine and Scopolamine Narcosis.** *Boston M. & S. J.*, 1920, clxxxii, 578.

Cæsarean section under local anæsthesia combined with morphine and scopolamine narcosis is a very valuable and successful method of effecting delivery in some of the graver complications of pregnancy. Such complications include cardiac disease in which there have been attacks of decompensation, diabetes, nephritis, cardiorenal disease, pulmonary tuberculosis, and bronchial asthma. In general, the operation finds its application in cases in which the pain and physical exertion of labor, the possible shock of an operative pelvic delivery, and the danger of a general anæsthetic are to be avoided.

Sufficient time must be allowed for both the general medication and the local anæsthetic to act. Deliberate operating with studious avoidance of roughness is essential to success.

For purposes of treatment patients with heart disease during pregnancy may be divided into two classes: (1) those who have never suffered a break in compensation, and (2) those who have. As a rule the first class may be treated under constant observation during pregnancy along general medical lines. Provided there is no malposition or no disproportion between the baby and the pelvis, such patients may be allowed to go into labor and to complete the first stage. The use of morphine and other sedatives, except chloral, during the period of dilation is advisable in order to make labor as easy as possible. After full dilation of the os the fœtus should be extracted with forceps under either anæsthesia in order that the muscular effort of expulsion may be avoided.

The author agrees with Newell that women with cardiac conditions should be delivered near term by section unless it appears probable that the first stage will be short and easy.

The second class of cases of cardiac conditions are more difficult as death may occur days after the completion of a successful labor. Irving advocates re-establishing broken compensation near term before doing a section, but states that if a break occurs early in the pregnancy the pregnancy should be terminated.

Brigham believes that in all cases of myocardial disease without valvular lesions which do not respond to digitalis the pregnancy should be terminated.

The chief objection to cæsarean section is that it is followed even more frequently than most laparotomies by intestinal distention and dilation of the stomach, both of which, but particularly the latter, may prove disastrous to an already embarrassed heart. These complications may be prevented by attention to three details:

1. The use of the low abdominal incision, entirely below the umbilicus. When the incision is made in this way the stomach and intestines do not come into the field at any stage of the operation.

2. The close approximation of the uterus to the abdominal wall by two assistants exerting firm pressure exteriorly against the patient's sides until the uterine contents have been completely evacuated. By this procedure the spilling of liquor amnii and blood into the peritoneal cavity is largely prevented.

3. The avoidance of gauze packs, either wet or dry.

The technique of operation is simple but careful attention to detail is of the utmost importance. In the author's cases no preliminary cathartic is given. The patient receives a low enema the morning of the operation. The ears are plugged with cotton to keep out sounds. While she is still in bed (if possible, her room should be on the same floor as the operating room) she is given  $\frac{1}{6}$  gr. of morphine and  $\frac{1}{200}$  gr. of scopolamine subcutaneously. The



morphine is not repeated. The same dose of scopolamine is repeated at forty-minute intervals until the patient is quiet and dozing. Three doses of scopolamine are usually necessary to produce the desired result, but as much as is required should be given. When the patient is in the condition desired, a folded towel is placed over her eyes and she is transported gently and quietly to the operating room. The operation is begun when she is asleep, never before. Just before the operation a final  $\frac{1}{200}$  gr. dose of scopolamine is administered to carry on the narcosis. No talking is permitted in the operating room, and the rattling of instruments and basins is carefully avoided. A nurse sits by the patient's head and takes her pulse at regular intervals. Speaking to the patient is absolutely forbidden. She lies upon the operating table without any restraint whatever.

When the patient is asleep the routine infiltration of 1 per cent novocaine or procaine is given, and a gentle caesarean section is performed. In closing the uterus, it is removed from the abdomen and supported with hot towels.

EUGENE CARY.

### LABOR AND ITS COMPLICATIONS

**Olow, J.: The Surgical Methods of Dilating the Cervix during Pregnancy and Labor** (*Sur les procédés chirurgicaux de dilatation du col utérin pendant la grossesse et l'accouchement*). *Gynéc. et obst.*, 1920, 1, 131.

Olow discusses section of both walls, section of the anterior wall alone, and section of the posterior wall with opening of the pouch of Douglas. He believes that the complications incident to each of these methods should be considered before a choice is made. The opening of the peritoneal cavity is a complication of the greatest gravity and outweighs the extraperitoneal character of the vaginal caesarean section. Lesions of the bladder, which are apt to occur in the anterior hysterotomy, may also be very dangerous if they cannot be repaired. These lesions are produced both during the surgical phase of the operation and during the extraction of the foetus. During the extraction tears occur in the cervix or vagina and extend into the bladder or peritoneum. The method of dilating to be used, therefore, should be the one in which there is the least danger that tears will be enlarged by ruptures. This cannot be determined from our present knowledge as the majority of such ruptures are unrecognized and consequently not reported.

By marking the upper limit of the cervical incision before version of the foetus in his own cases Olow found that rupture occurs often but he has not sufficient data to say definitely which method is the most satisfactory.

Duehrssen rejects all other operations after hysterotomy except version and podalic extraction but Olow does not see the reason for this. The circumstances under which vaginal caesarean section is practiced most frequently impose delivery by this

method, but if the head is fixed and the membranes are ruptured, forceps extraction is evidently the method of choice as under such circumstances version might be a very risky procedure. The fact that the delivery channel has been widened with a cutting instrument does not alter the indications for forceps extraction but makes greater gentleness necessary.

The manual removal of the placenta followed by tamponade of the uterine cavity, which has been adopted by some operators, seems to Olow dogmatic. Usually spontaneous detachment may be expected and drainage of the uterine cavity by a rubber or glass cannula is preferable.

Olow believes that cervical dilatation is within the power of every practitioner and states that the instrumentation required is simple. Such an operation, a veritable vaginal caesarean section, may often save life.

In his own practice Olow begins with a colpoperineorrhaphy if the vulva is narrow and the vagina long. He cuts the anterior lip as far as the vaginal vault and continues the section for some centimeters on the anterior vaginal wall. A speculum is then inserted and the bladder displaced with the finger. Section of the cervical wall is continued until the peritoneum of the vesico-uterine sac is seen. If the opening is then sufficient, extraction is continued, but if not, either the incision of the anterior wall is lengthened obliquely or a new incision on the posterior wall is made. The upper ends of the incisions are marked with catgut sutures. Generally the extraction is effected by the foot after version but in some cases the forceps are used. If haste is necessary the Credé method may be employed in the extraction of the placenta.

W. A. BRENNAN.

### PUERPERIUM AND ITS COMPLICATIONS

**Balard, P.: The Value of the Minimum Pressure in the Prognosis of Severe Puerperal Hæmorrhage** (*La valeur de la pression minima comme élément de pronostic des hémorrhagies graves de la puerpéralité*). *Rev. franç. de gynéc. et d'obst.*, 1920, xv, 154.

According to Balard, the different methods of judging the gravity of obstetrical hæmorrhages fail in actual practice because they do not give sufficiently definite indications as to the need for transfusion. In the sudden hæmorrhages of delivery and in hæmorrhages due to a viciously inserted placenta the persistence of the necessarily lowered pressure renders the prognosis very grave. Observations of the maximum pressure are not a satisfactory index of the patient's condition but observations of the minimum pressure make it possible to judge the condition of the circulatory system correctly.

Three cases are reported in detail. In the first, which terminated in death, oscillometry registered pulsations which were not perceived with the finger. The minimum pressure was 5 cm. Hg. a half hour after general treatment with cardiac tonics was



begun. In the other two cases, which were followed by recovery, the minimum did not fall below 7 cm. Hg. but there were very decided variations in the maximum pressure. In the author's opinion 5 cm. Hg. represents the extreme limit of low pressure at which circulation is assured. W. A. BRENNAN.

#### NEW-BORN

**Holtz, E.: The Diphtheria Endemics of the New-Born in Obstetrical Clinics and Their Significance** (Die Diphtherie-Endemien der Neugeborenen in den Frauenkliniken und ihre Bedeutung). *Zentralbl. f. Gynaek.*, 1920, xlv, 195.

The author discusses the various views expressed in the literature regarding the origin of the antitoxin found in the blood of the new-born. According to Wassermann, this antitoxin is derived from the mother as most adults have antitoxic substances in their blood. In Roemer's opinion, the child obtains the antitoxin in the mother's milk. Eich reports that 84 per cent of the new-born possess antitoxin against diphtheria. Arnim has called attention to the endemic nature of this disease in obstetrical clinics, and Blochmann, Eich, Kirstein, Freund, and Wiegels have reported numerous such endemics.

The author reports an endemic which occurred in the Koenigsberg obstetrical clinic in March, 1918. In some cases snuffling and the formation of a membrane on the septum and lower turbinates were the only clinical symptoms. Of 219 children, 76 (35 per cent) gave a positive reaction.

The infection may have its origin in carriers in the clinic, carriers among the visitors, infected infants brought to the clinic, the maternal vagina, and patients in the clinic. Cases in which the infection was derived from the maternal vagina have been reported by Broer and Roethel. If more than one epidemic occurs in the same clinic it may be a re-awakening of an old infection. To overcome such endemics strict isolation is necessary. Not infrequently the diphtheria bacilli are found in persons without the slightest trace of the disease, but as these carriers may be dangerous to others systematic examination of the mothers and nursing staff is essential.

VORSCHUETZ (Z).

**Reed, C. B.: The Postmature Child.** *Surg., Gynec. & Obst.*, 1920, xxx, 589.

This article is based on the following facts:

1. The actual duration of pregnancy has not been established and estimations are never more than approximations.

2. Gestation is frequently abbreviated or unaccountably prolonged.

3. The prolongation of pregnancy is a definite factor in the production of the postmature child.

4. Postmature babes are usually, though not necessarily, large and fat, weighing 4,000 gm. or more.

5. Probably from 6 to 8 per cent of pregnancies are prolonged (Parvin) and 71.8 per cent of all

babies weighing over 4,000 gm. are postmature (von Winckel).

6. A possible etiological factor may be found in the large and functionally strong placenta which are usually associated with large babies.

7. Large babies lose much weight rapidly and therefore have no advantage over smaller babies.

8. As a basis for the calculation of the proper end of gestation foetal maturity is safer and more certain than the menstrual history, the date of a known coitus, or the date of quickening.

9. Foetal maturity, although fundamentally bound up with organic perfection, is in reality associated with reasonably stable objective characteristics the most important of which are the length, the weight, and the head diameters.

For completeness the author refers briefly to the dangers which attend the birth of a large or postmature child. As soon as the weight of the child passes 4,000 gm. the difficulties of labor tend to become serious. When after repeated examinations, the obstetrician is assured that the child is sufficiently mature to begin extra-uterine life easily, it is not necessary for the pregnancy to be prolonged further. This condition may readily eventuate two weeks before term, or exactly at the fortieth week. If the child is small, however, it may be best for the pregnancy to continue beyond the fortieth week.

The most conspicuous features of maturity must be sought in the perfection of the various organs, the length and weight of the foetus, and the diameters of the foetal head. The child's length and weight and some of the diameters of the head are the only characteristics which can be determined by external measurement and therefore those upon which a diagnosis of maturity *in utero* can rest. Fortunately they are sufficient.

The child's length can be obtained by the familiar method of Ahlfeld. In the author's cases the antepartum measurements tallied exactly with the postpartum findings in 37 per cent, varied 0.5 cm. or less in 24 per cent, and varied less than 1.5 cm. in 29 per cent. None of these differences was great enough to interfere with the diagnosis seriously. The author regards the procedure of great diagnostic value. Its simplicity is also in its favor. One tip of the pelvimeter is placed under the upper fold of the genital crease and pushed upward until it rests on the upper edge of the symphysis. The other tip is placed on the most distant point of the opposite pole of the child (head or breech) which has been located previously. From the scale reading 2 cm. are deducted to allow for the thickness of the abdominal walls. The result is multiplied by 2. The product is the child's length. The child's size is merely another name for its weight. This information is obtained by means of McDonald's manoeuvre, which measures the height of the fundus. On the basis of large masses of material Varnier, Spiegelberg, and others have stated that the fundus uteri should be 33 cm. above the symphysis when it contains a mature child at term.



McDonald takes 35 cm. as the standard and predicates that this height is attained when the uterus holds a mature foetus weighing 3,300 gm. ( $7\frac{1}{3}$  lb.). The weight of the child is increased or diminished by 200 gm. for each variation of 1 cm. in the height of the fundus. The author states that so far as maturity is concerned he has not been disappointed with this procedure. The weights, however, do not always conform to the estimates.

The diameters of the foetal head are obtained by Perret's method which takes the occipitofrontal diameter directly and derives the biparietal from it by deductions which have been worked out on a scale of variables.

Perret planned at first to measure the occipitofrontal diameter as it lies across the pelvic inlet and then deduct 2.5 cm. to obtain the biparietal diameter. The results, however, were not as reliable as desired. Stone then advised the omission of an allowance for the thickness of the abdominal walls. McDonald, recognizing the fact that the biparietal diameter must vary with the occipitofrontal diameter, devised a scale of deductions. This scale, which the author has used in his series of cases with a trifling addition, is as follows:

To obtain the biparietal diameter from the			
Occipitofrontal of . . .	12	cm.	deduct 2.5 cm.
" " . . .	11.5	"	" 2.25 "
" " . . .	11.25	"	" 2.0 "
" " . . . 10.5 to 11		"	" 1.5 "

The occipitofrontal poles are engaged between the tips of the fingers by deep pressure into the inlet on both sides of the pelvis. An assistant then measures the distance between the ends of the finger tips with the pelvimeter. The result is compared with the scale and the proper deduction made.

In the author's series of cases the measurements of the occipitofrontal diameter antepartum tallied exactly with the postpartum control in 40 per cent. It was within .025 cm. in 34 per cent, and within 0.5 cm. in 24 per cent. In 2 per cent it varied by 1.0 cm.

The biparietal diameter obtained from the measurements given was exactly the same as the postpartum findings in 36 per cent, within 0.25 cm. in 31.7 per cent, within 0.5 cm. in 25.8 per cent, and within 1.0 cm. in 5. McDonald's results were even better. In the author's experience, the estimation of the foetal size and head diameters is far more reliable than the determination of the pelvic diameters by the usual procedures.

If the child is mature and the pelvis not seriously contracted, the induction of labor may be delayed for several days or a week.

The induction may be brought about easily, safely, and expeditiously by castor oil and quinine or the Voorhees bag, or by both. Castor oil and quinine are effective in possibly 2 cases out of 5 but the Voorhees bag is always dependable.

C. H. DAVIS.

# GENITO-URINARY SURGERY

## ADRENAL, KIDNEY, AND URETER

Serés, M.: **The Surgical Anatomy of the Renal Pelvis and Calyces** (*Anatomía quirúrgica de la pelvis renal y cálices*). *Prog. de la clín.*, Madrid, 1920, viii, 125.

The author's review of the surgical anatomy of the renal pelvis and calyces precedes a discussion of the indications for, and the technique of, pyelotomy and nephrotomy for the extraction of renal calculi. His descriptions are based upon a study of numerous pyelograms, metal casts, and dissections made while he was Professor of Urology in the University of Seville.

The normal pelvis is almost triangular or funnel shaped. The widest part just within the hilum presents an unbroken posteromesial surface, while the opposite side directed toward the renal substance is interrupted by the subdivisions of the pelvis. Normally very little urine accumulates here so that the region may be readily distended by injections in pyelography. The form of the renal pelvis depends upon the disposition and ramifications of the calyces, and upon this basis there are six types:

Type 1. The typical pelvis. The typical pelvis is that which is divided into an upper and a lower segment, the calyces majores. Three principal divisions are often encountered however, and are regarded as normal. The superior major calyx is longer and more nearly a prolongation of the pelvis. The inferior calyx is shorter and larger and directed horizontally toward the inferior pole. When a third major calyx is present it joins the inferior calyx more frequently than the superior calyx.

Type 2. The branched pelvis. In the branched pelvis, which is next in order of frequency, there are three major calyces each emptying into the pelvis separately. The central calyx may be double, each part emptying separately into the pelvis. In this case the calyces are not all in the same plane, one of those in the center being directed anteriorly and the other posteriorly. A case of five calyces entering separately into the pelvis has never been observed, nor a case of complete absence of the pelvic cavity in which the ureter could be regarded as a direct continuation of the calyces.

Type 3. Hemipelvis. Two varieties of hemipelvis have been observed, the inferior and the inferomedial. The hemipelvis inferior consists of a very large inferior calyx receiving many secondary calyces and a smaller superior calyx. The inferomedial hemipelvis represents a fusion of the inferior and medial major calyces. The form of the pelvis is somewhat rectangular.

Type 4. Ampullar pelvis. This type represents a more or less complete fusion of the major calyces producing a pelvis of large volume into which secondary calyces empty directly. It occupies almost the entire renal sinus.

Type 5. Infantile pelvis. The infantile pelvis is a rare form in which the original infantile type persists. It is of slight development and ramification and but little differentiated from the ureter.

Type 6. A principal pelvis with secondary pelves. In this type secondary calyces unite to form secondary pelves somewhat dilated and poorly developed which in turn unite to form a poorly developed primary pelvis.

The renal pelvis lies normally partly within and partly without the renal sinus. It is the extrasinual portion upon which pyelotomy is performed. There are cases, however, in which the renal pelvis is situated entirely within the sinus and others in which it is entirely extrasinual, depending upon the form and ramifications of the pelvis and the form and size of the renal sinus. If there are many ramifications and especially if they begin near the termination of the ureter, the pelvis is located outside of the kidney, while if there is little branching and the pelvis is underdeveloped, it is more apt to be situated within the sinus.

The most important relation of the pelvis to surrounding structures to be borne in mind in performing pyelotomy is its relation to the renal artery and its branches. The renal vein runs in front of the artery and therefore is not so closely related to the renal pelvis. Usually each kidney has only one artery, but not infrequently there are two, and in exceptional cases three and four. The principal artery passes to the hilum, giving off small rami to the adipose tissue, then divides into a principal anterior and posterior branch, each of which embraces the pelvis and divides into smaller rami before entering the renal substance. The retropelvic branch is of the most importance in pyelotomy.

The author gives both the anatomical and the physiological dimensions and capacities of the pelvis.

The physiological capacity is the amount of liquid which may be introduced by ureteral catheterization without evident pelvic tension. The average is from 6 to 7 ccm. The anatomical capacity is the maximum amount of liquid which may be introduced in the postmortem examination and is usually near 15 ccm. The average physiological dimensions are: height, 18 mm., width, 21 mm., and thickness, 8 mm. The anatomical dimensions taken from moulds are: height, 22 mm., width, 25 mm., and thickness, 16 mm.

W. R. MEEKER.



**Herrick, F. C.: Resection of Double Kidney.** *Surg., Gynec. & Obst.*, 1920, xxx, 560.

The author reports a case of his own, 2 cases reported by Rumpel, 1 case reported by Young and Davis, and 3 cases reported by Mayo.

The author's patient was a woman 18 years of age who suffered from attacks of pain in the region of the right kidney which were associated with soreness in the right flank. Physical examination showed the right kidney to be movable and tender, and pyelography demonstrated the presence of a double renal pelvis. A pre-operative diagnosis of double kidney on the right side with a hydronephrotic lower pelvis was made. The kidney was resected and the patient made an uneventful recovery.

The author offers the following conclusions:

1. Resection of a diseased double kidney or the diseased portion of a single kidney may be advisable in order to save a necessary amount of kidney substance.

2. The resected end-surface should be covered with fatty capsule.

3. In the literature available only 4 other cases of resection of a double kidney are reported.

H. L. KRETSCHMER.

**Casper, L.: Renal Hæmorrhages, Their Diagnosis, Prognosis, Pathognomonic Significance, and Treatment** (Nierenblutungen, ihre Diagnose, Prognose, ihre pathognomonische Bedeutung und Behandlung). *Med. Klinik*, 1920, xvi, 169.

Not only macroscopic but also microscopic hæmorrhages are of great significance in the diagnosis of renal conditions. In normal urine blood cells are seen only occasionally. Whether the blood comes from the bladder or the kidney can be decided definitely only by means of the cystoscope and the ureteral catheter. The extent and the duration of the hæmorrhage in combination with symptoms and signs obtained by other methods of examination often lead to the discovery of the causal factor, as in nephritis, stone, and tuberculosis.

There are rare cases of nephritis in which severe hæmorrhage is the only sign for a long time before traces of albumin and casts are found in the urine. Hæmorrhage due to stone is usually slight. It is induced or increased by exertion and disappears with rest. Small uric acid stones are not shown by the X-ray. In tuberculosis of the kidney the bleeding is more marked in the early stages of the condition than later. Some cases begin with a severe hæmorrhage but usually only small amounts of blood are lost. The diagnosis is confirmed by the demonstration of the tubercle bacilli and by animal inoculation. Every tuberculous kidney shows diminished function as soon as hæmorrhage occurs.

In tumors of the kidney hæmorrhage is frequently the only symptom. It may be profuse and persist for a long time, it is not benefited by any therapy, and it may stop as suddenly as it began. The functional tests are of value only when the tumor mass infringes upon or destroys the kidney tissue and

when the findings on palpation and the cachexia leave no room for doubt regarding the diagnosis. To confirm the diagnosis in certain cases, however, an exploratory operation may be necessary.

Among the rare causes of hæmorrhage are aneurism of the renal vessels and arteriosclerosis. In the so-called essential hæmaturias—renal hæmophilia—certain changes are noted but the same variations occur in the normal kidney and are not the cause of the bleeding. In one case the author found the blood in the capsular spaces and in urinary tubules which showed no pathologic changes. In such instances angioneurotic factors must be the exciting cause.

In moderate hæmorrhages the cause determines the treatment. When the bleeding is due to stone, pyelotomy is the operation of choice as nephrotomy may be followed by secondary hæmorrhage and infection of the infarct. In cases of tuberculosis in which one kidney is functioning well and in cases of tumor of the kidney nephrectomy is indicated. Severe hæmorrhages can be checked only by operation; internal medication is futile. When the hæmorrhage is due to nephritis expectant treatment should be given as such hæmorrhages usually cease spontaneously and the nephritis is bilateral even when only one kidney bleeds. In renal hæmophilia intervention is necessary when a renal tumor cannot be excluded definitely. If nephrotomy with tamponade does not suffice, nephrectomy should not be postponed too long. TROMP (Z).

**Eisendrath, D. N.: The Diagnosis of Tuberculosis of the Kidney.** *Chicago Med. Rec.*, 1920, xlii, 225.

In no other surgical lesion of the kidney are the end-results of treatment so satisfactory if the diagnosis is made early as in renal tuberculosis. From 45 to 60 per cent of these cases, however, are treated for months and sometimes for years as cystitis, and the underlying tuberculosis remains unrecognized.

Eisendrath classifies cases of renal tuberculosis into 6 general types according to the onset of the condition: (1) those in which the symptoms of cystitis predominate; (2) those in which the first symptom is a more or less severe hæmaturia; (3) those in which the symptoms point directly to the kidney, or both renal and vesical symptoms are combined; (4) cases of apparently acute onset characterized by chills, fever, and local symptoms resembling those of ordinary pyogenic infection of the kidney; (5) so-called "silent" cases in which loss of weight and strength and indefinite lumbar or abdominal pain are usually associated with the presence of a tumor in the region of the kidney (closed pyonephrosis); and (6) those in which the appearance of a perinephritic abscess is the first symptom.

Case reports illustrating these various types are given. The possibility of renal tuberculosis must always be considered whenever one of the groups of clinical symptoms described is noted. Only by a most thorough study of the entire urinary tract is it possible to exclude other forms of renal infection.



The more important data upon which a diagnosis of renal tuberculosis may be based are:

1. Bladder symptoms. These consist of increased frequency of urination at first at night, but later also during the day; painful urination which is concomitant with the increased frequency and gradually becomes more marked; and great irritability or incontinence.

2. Kidney symptoms consisting of a dull ache or recurrent colicky pains on the affected side or, in cases of bilateral involvement, on both sides.

3. Fever. As a rule the fever is slight unless there is a mixed infection or sudden retention.

4. Urinary findings such as pyuria, hæmaturia, and the presence of tubercle bacilli in the urine. In closed pyonephrosis, however, neither pyuria nor tubercle bacilli will be found. In open pyonephrosis the bacilli can be demonstrated in about 80 per cent by the Forasell or Crabtree method.

5. Cystoscopy and ureteral catheterization. This is the most important single method of diagnosis.

6. Pyelography and X-ray examinations. These should be routine in all cases as they give much valuable information as to changes in the renal pelvis and parenchyma.

JOHN P. O'NEIL.

**Tardo, G. V.: A Rare Case of Renal Calculus** (Su di un raro caso di calcolosi renale). *Policlin.*, Roma, 1920, xxvii, sez. chir., 145.

The author's case was that of a man 38 years of age. The stone, which weighed 804 gr., was the largest that has ever been removed.

The calculus had been present from the patient's birth. For twenty years the condition had been aseptic but during the last eighteen years there had been urinary infection. This infection was so slight, however, that it had not caused any destruction of the kidney substance and had remained localized in the renal pelvis. The cortex of the calculus was of a very peculiar chemical composition, being made up of nearly pure ammonium magnesium phosphate.

The kidney showed chronic interstitial nephritis, which was localized in certain zones of the parenchyma and compensatory hypertrophy. The evolution of the sclerosis was as follows: (1) perivascular inflammatory infiltration; (2) the formation of new tissue which at first was connective tissue and later fibrous; (3) the formation of chronic inflammatory vascular lesions (proliferating endarteritis and peri-arteritis); (4) sclerosis and hyalinization of the glomeruli in the regions in which the vascular changes were most pronounced; and (5) atrophy of the renal tubules consecutive to the glomerular lesions or to strangulation caused by the augmented or sclerosed connective tissue.

The chronic interstitial nephritis due to the calculus was of the hæmaturic type. Because of the chronic inflammation the pelvis and calices showed muscular hypertrophy, cellular hypertrophy in all the strata, metaplasia and keratinization of the covering epithelium, and proliferation of the mucosa in

papillary form (polypous pyelitis). There was also a limited cystic pyelitis. The changes in the mucosa of the pelvis were very similar in type to those caused by certain pelvic neoplasms.

The patient was operated upon under local anaesthesia. The right kidney was exposed through a lumbar incision and incised longitudinally. It was then removed. The patient made an excellent recovery.

W. A. BRENNAN.

**Fraser, J.: Adenosarcomatous Tumors of the Kidney; A Clinicopathologic Study.** *Edinburgh M. J.*, 1920, n. s. xxiv, 372.

The author has seen 7 cases of kidney tumor in children. The youngest child was 1 month old and the oldest 6¼ years. A review of the histories of 85,000 hospital cases showed that there was no case of renal tumor in a child older than 7 years. The tumors occurred with equal frequency in both sexes and on both sides. In 1 case there was bilateral involvement.

The symptoms are constipation, hæmaturia, distention of the abdomen, and enlargement of the superficial abdominal veins. Hæmaturia is a rare symptom and occurs only in the earliest stages of the disease. It is due to destruction and obliteration of the kidney pelvis by the tumor.

Pathologically renal tumors show six types of tissue: (1) true renal tissue; (2) ancinar or adenomatous tissue; (3) sarcomatous tissue; (4) non-striped muscular tissue; (5) connective tissue; and (6) vascular tissue. The blood supply is very meager. The growths are ovoid and contain a sarcomatous mass in the center surrounded by sarco-adenomatous tissue and then by adenomatous tissue. At either pole is relatively normal kidney tissue. In the author's opinion the muscle tissue in the tumor is derived from that of the normal kidney pelvis.

Constipation in cases of renal tumor results from the encroachment of the growth on the colon and interference with the colonic blood supply. There may be mechanical interference also with the duodenum.

The treatment indicated is early operation by the transperitoneal route with the patient in the Trendelenburg position.

V. D. LESPINASSE.

**Chute, A. L.: Secondary Nephrectomy.** *Internat. J. Surg.*, 1920, xxxiii, 186.

The number of secondary nephrectomies is increasing with the increase in conservative kidney surgery. In reviewing 20 cases of secondary nephrectomy, Chute divides such cases into two classes: (1) those in which the nephrectomy was deferred in order to diminish the risk, and (2) those in which a nephrectomy was not intended at first but became necessary later.

The first class includes cases of suppuration of the kidneys so toxic that the patient might not stand the shock of nephrectomy. In such cases primary drainage and secondary nephrectomy resemble the



two-stage operation for prostatitis. Chute performed a two-stage nephrectomy in cases of pyonephrosis, renal stone, tuberculosis, perirenal abscess, and hydronephrosis, and is convinced that the mortality would have been much higher if a primary nephrotomy had been done.

The second class of cases requiring secondary nephrectomy represent errors in diagnosis and judgment and include cases of recurrent stone, urinary sinus, colicky pain due to adhesions to the colon, and pyelolithotomy. When a kidney containing a stone is already infected, or infection is imminent, an incision through the cortex gives better drainage than an incision through the pelvis. The recuperative power of the kidney given adequate drainage is remarkable. The pelvis incision favors recurrence of stone, progression of renal infection, and the persistence of fistula, all of which will render a secondary nephrectomy necessary.

A stone in the lower end of a disused ureter gives no trouble.

There is no standardized technique for secondary nephrectomy but the operation becomes more difficult as the time elapsing after the primary operation becomes greater. The sinus should be clamped, tied, treated with iodine, or plugged, and the scar excised. When a tumor is present the rectal incision gives good approach. The pedicle should be ligated by a ligature passed through it on a needle, and if necessary a clamp should be left on the pedicle for a week. It is not necessary to take out the ureter.

The chief danger in secondary nephrectomy is the danger of tearing into the colon, diaphragm, peritoneum, or vena cava during the separation of adhesions.

In the postoperative treatment intestinal distension may be relieved by enemas given several times a day, and nausea overcome by large infusions of salt solution or transfusion if much blood has been lost.

B. F. ROLLER.

**Fowler, O. S.: Differential Diagnosis of Ureteral Obstruction from Lesions of the Abdominal Organs.** *Colorado Med.*, 1920, xvii, 159.

The author emphasizes the importance of positively excluding lesions of the kidney before resorting to exploratory abdominal operations. He cites cases in which the appendix, gall-bladder, ovaries, tubes, and uterus were removed and the causative factor of the condition was later proved to be a ureteral obstruction or a lesion in the kidney.

A negative urine does not prove the absence of a lesion of the kidney nor does a negative X-ray plate for stone exclude such a lesion when there is pain simulating that caused by stone. X-ray plates made following injections and with the patient lying prone have no value except to determine the presence of stone and severe lesions of the kidney.

In the author's opinion "chronic appendicitis" is more or less a misnomer and the condition to which it is applied can be diagnosed only by exclusion, chiefly of lesions in the right kidney.

Fowler has performed nearly two hundred nephroplexies by the use of fascia as described seven years ago and has obtained most gratifying results. The Edebohl operation he believes is inadequate and usually leaves the associated constipation worse than before.

T. F. FINEGAN.

**Wade, H.: The Diagnosis and Treatment of Calculus in the Pelvic Portion of the Ureter.** *Edinburgh M. J.*, 1920, n. s. xxiv, 392.

The author points out that there is a definite etiological relationship between diminished fluid intake, excessive perspiration, and the formation of urinary calculi. The symptoms due to stone in the ureter are vomiting and pain situated usually in the lumbar muscles or the epigastrium. Radiation of pain to the penis and testicles is rare. In 50 cases treated by the author tenderness was present in the lumbar region or well out on the sides of the abdomen and there was frequency of urination. The urine contained blood during acute attacks and crystals constantly. In many cases enlargement and prolapse of the kidney on the affected side was found.

Six of the 50 cases were operated upon; 2 by means of intravesical forceps, 2 by suprapubic cystotomy, and 2 by suprapubic opening of the ureter. In regard to the treatment the author states that the patient should be instructed to drink large amounts of water and all intravesical methods of removing the stone should be tried before resort is had to abdominal operation.

V. D. LESPINASSE.

**Crowell, A. J., and Thompson, R.: Further Observations on the Technique of Removing Ureteral Calculi without Operation.** *South. M. J.*, 1920, xiii, 446.

The authors' method of dislodging recently impacted stones in the ureter is as follows:

A bismuth catheter is inserted into the ureter until it meets with the obstruction. An X-ray picture is taken to determine definitely whether the obstruction is a stone and to ascertain its size and location. (Ureteritis, ureteral stricture, ureteral kink, and pressure on the ureter often simulate ureteral stone.) Two cubic centimeters of a 2 per cent solution of cocaine or procaine are slowly injected into the ureter at the site of impaction. In this way the ureteral spasm is relaxed so that as a rule the catheter may be passed beyond the stone in a few moments.

Another cubic centimeter or two of the anæsthetic is then injected to deaden the sensation further. The kidney pelvis is then distended with physiologic salt solution and sterile olive oil is injected as the catheter is removed. By this means the pressure above the stone is increased while the muscular fibers of the ureter are relaxed and sensation is deadened.

If the eye of the catheter cannot be passed above the stone, sterile oil is injected against it with considerable force to dislodge it, to lubricate the parts,



and to dilate the ureter below the obstruction. The patient is given morphia and instructed to drink water freely. The procedure is repeated every second or third day, the size of the ureteral catheter being increased at each treatment. Frequently a No. 11 stoppered catheter is inserted and left *in situ* for hours. This is especially beneficial when it is impossible to pass by the stone and the obstruction to the secretion is incomplete.

In the authors' experience the average number of treatments necessary to remove the calculus was 7, the minimum number was 3, and the maximum number 11.

V. D. LESPINASSE.

### BLADDER, URETHRA, AND PENIS

**Day, R. V.: Contracture of the Bladder Neck and Other Obstructions.** *California State J. M.*, 1920, xviii, 158.

The author believes that there are four feasible and successful methods of treating median bar contractures of the bladder neck:

1. Young's classical punch operation through the intact bladder and urethra.
2. MacGowan's modification with the bladder opened suprapubically or an incision through the prostatic, membranous, or bulbous urethra (usually the prostatic).

3. Bugbee's high-frequency current method.

4. A method devised by the author and described Nov. 20, 1915, in the *Journal of the American Medical Association*. At the time this method was first reported the technique was somewhat crude, but the development of special electrodes has made the procedure more simple and accurate in the hands of the experienced urologist and in selected cases.

At the hospital Day invariably does the punch operation by the open method, almost always with a suprapubic opening. He uses this method also in private practice if the patient is not a good risk as to lungs, heart, and kidneys or if he is sensitive. In the cases of strong patients he prefers the original punch operation of Young through an intact urethra and a closed bladder. Bugbee's cautery has very definite advantages but has also the disadvantage that it may be followed by recurring epididymitis, urinary fever, and occasionally by bleeding.

The author's method is precisely the same as the original punch operation except that the bar projecting into the fenestrum of the punch is needled with a small and especially insulated electrode in order to cook it with the high-frequency d'Arsonval current and to prevent bleeding after it is punched away. After it is cooked it must be punched out before the punch can be removed. Young's light carrier is used to illuminate the area in which the needling is done, and an electric suction pump is employed to keep the field dry and do away with reflected light.

This procedure the author claims is useful when the bars are thin and is of value for the removal, following convalescence, of small obstructions such

as the tags of capsules and small pieces of prostate which, adhering to the bladder neck or overlooked at the time of operation, form a shelf. The so-called trap-door obstructions he punches through the urethra with the bladder opened suprapubically, but if they are small he uses his own high-frequency current method through the urethra, leaving the bladder intact.

In conclusion Day claims the advantages of his method are that it is followed by an easy convalescence, it removes obstructions thoroughly, and it prevents high temperature and tenesmus.

LOUIS GROSS.

**Perrier, C.: The Endoscopic Treatment of Bladder Tumors with the High-Frequency Current** (*Traitement endoscopique des tumeurs de la vessie par les courants de haute fréquence*). *Rev. m d. de la Suisse Rom.*, 1920, xl, 313.

Perrier gives the details of 6 cases of papillomata of the bladder treated by electrocoagulation. All of the patients were ambulatory and continued their occupations, one of them walking 7 miles after each treatment. In other cases still under electrical treatment a prior cystotomy and ablation of the tumor were done because of the size of the growth, and the electrical treatment is now being applied to the pedicle and smaller nodules.

In Perrier's opinion endovesical electrotherapy has completely changed the treatment of vesical papillomata, and in many cases it obviates surgical intervention.

W. A. BRENNAN.

**Smith, R. R.: Prolapse of the Female Urethra.** *J. Am. M. Ass.*, 1920, lxxiv, 1639.

In making an examination in cases of prolapse of the female urethra a thorough examination of the meatus urinarius is necessary. When the patient is relaxed and is lying on her back the meatus and anterior vaginal wall close to it protrude but little, if any, whatever the condition present, and are apt to be regarded as quite normal. If the patient strains, however, the meatus and the anterior vaginal wall back of it bulge forward and roll upward if there has been an injury at this point.

Not infrequently close observation will disclose an  dema of these structures. Of greatest importance is the condition of the meatus itself. The mucosa at the lower end of the urethra is seen to roll slightly out of the meatus, exposing to view a bit of the tender lining of the canal. The meatus may be found to be larger than usual, its two small lips torn or stretched and offering a very imperfect covering for the sensitive membrane within. The mucosa is not infrequently the seat of a so-called caruncle which is sometimes extremely sensitive. When in this condition the patient is up and about, and when she strains to evacuate the bowel or bladder, the protrusion is produced many times a day. If she is asked whether there is tenderness at this point and whether she has discomfort there the answer will frequently be in the affirmative. The



passage of urine over a swollen, irritated meatus causes a burning sensation.

At operation the caruncle or protruding mucosa is first removed. This should be done with the greatest delicacy as the tissue is extremely soft and bleeds freely. Occasionally a very fine stitch or two on a fine needle is necessary. More important is the closure of the meatus to its normal dimensions. This is done by making a small denudation, removing a bit of the circumference of the meatus, and denuding a little of the surface beneath it. The placing of the fine chromicized sutures will vary according to the requirements of the particular case, but there is little difficulty in this part of the operation. Following this step a large triangular denudation of the protruding anterior vaginal wall is done, the base of the triangle being placed as high as the under edge of the pubic bone, or slightly higher, so that when it is closed by sutures the meatus is drawn back to a normal position. The stitches, which of course must avoid the urethra, are inserted deep enough to obtain a good hold of the firm tissue close to the pubic bone. As suture material the author generally uses chromicized catgut.

THEODORE DRÖZDOWITZ.

#### GENITAL ORGANS

**Hunt, V. C.: Benign Hypertrophy of the Prostate.**  
*J.-Lancet*, 1920, xl, 267.

The advance which has been made in the management of hypertrophy of the prostate is due not only to improvement in the operative procedure, but also very largely to the pre-operative and post-operative treatment.

Correlation of embryology and pathology may explain the frequency of hypertrophy in some portions of the gland and its infrequency in other portions. It has been shown quite definitely that each lateral lobe, the middle lobe, the posterior, and the anterior lobes develop separately and as distinct lobes from evaginations of the prostatic urethra with the formation of tubules. At birth, the lateral and median lobes have larger and more numerous tubules. The posterior lobe has very few, and the anterior lobe practically none. Those of the anterior lobe reach their maximum development at about the twentieth week of foetal life, after which time they nearly disappear. The initial change in prostatic hypertrophy has been shown to occur in the epithelium of the tubules of the lobes. Therefore it seems logical to assume that hypertrophy occurs most frequently in the lobes which possess the larger and more numerous tubules. This hypothesis may account for the great rarity of

hypertrophy in the anterior lobe, its infrequency in the posterior lobe, and its frequency in the median and lateral lobes.

Enlargement of the prostate is benign in approximately 80 per cent of cases. In the remaining 20 per cent the growth is carcinoma which practically always begins in the posterior lobe. The enlargement produces mechanical obstruction at the vesical neck with resultant residual urine, back pressure in the bladder and kidneys, and infection. The condition is then no longer local, but affects the entire urinary tract and the patient's general condition.

The advisability, the type, and the time of operation should be decided from the amount of local or primary change in the prostate, the secondary effects of the prostatic enlargement on the entire urinary tract, and the patient's general condition. This may be determined by means of a careful physical examination and laboratory tests. In estimating renal efficiency the phenolsulphonephthalein and blood-urea tests are of great importance.

In the author's experience immediate prostatectomy is not advisable when there is more than 2 or 3 oz. of residual urine or infection of the urinary tract. When there is much residual urine, and particularly when a large quantity of residual urine is associated with infection and pyelonephritis, the diminished phthalein and urea retentions are accurate criteria of the renal insufficiency. In such cases the patient should be prepared for prostatectomy by drainage of the bladder effected, if possible, by permanent or intermittent urethral catheterization. Suprapubic drainage should be used only when the patient does not tolerate the urethral catheter or improve by its use, in cases in which all the urine is residual urine, in cases presenting symptoms of uræmia, and in cases of chronic retention or severe cystitis. The preliminary drainage and irrigations should be continued until the patient's general condition is much improved and the phthalein and blood-urea determinations have approached normal. Preliminary drainage of the bladder is the basis of successful management.

The mortality rates of the perineal and suprapubic operations for prostatectomy are low and approximately equal. The advantages of the suprapubic operation are: (1) it approaches the portion of the prostate involved by benign hypertrophy directly; (2) it rarely causes injuries resulting in the formation of fistulæ and incontinence; (3) the technique is accurate; and (4) it permits thorough exploration of the bladder by sight as well as by palpation, such exploration making it possible to remove large stones and to deal with diverticula or other associated lesions of the bladder.

# SURGERY OF THE EYE AND EAR

## EYE

**Jackson, E.: Pseudotumors of the Uveal Tract.** *Am. J. Ophthalm.*, 1920, iii, 397.

The author uses the term "pseudotumors" because the term "tumor" might suggest a malignant growth. He discusses tumors of the iris, the ciliary body, and the choroid and reports some of his own cases and a number of those reported recently by others. In his conclusions he emphasizes again the necessity for careful tests for syphilis and tuberculosis in particular. As a rule malignancy may be excluded by keeping the lesions under observation for a period of several months or years. "So long as the mass does not increase, watchful waiting is justified if the eye still retains vision. . . . For a choroidal sarcoma in the first stage the risk from a few weeks' delay until it shows unmistakable progress is problematic and scarcely to be weighed against the loss of a useful eye on a doubtful diagnosis." Jackson suggests that careful drawings be made when the case is first seen and compared with the subsequent appearance.

T. D. ALLEN.

**Green, A. S., and Green, L. D.: An Operation for Keratoconus, with Report of Two Cases.** *Am. J. Ophthalm.*, 1920, iii, 429.

Reasoning from the effect of myotics on keratoconus, the authors have come to the conclusion that its cause may be too great intra-ocular tension for an inherently weak cornea. The object of their treatment, therefore, is to reduce the tension permanently. They use a modification of the Lagrange operation for glaucoma, and in this article illustrate the various steps by means of nine drawings. The procedure is essentially a subconjunctival excision of a piece of sclera at the limbus combined with an iridectomy. In addition, a canthoplasty is done to overcome the excessive pressure of the lids. With the exception of the canthoplasty they have used the same operation for two years in cases of glaucoma.

The result of the treatment described is an increase in vision and a decrease in the astigmatism. In one case the central nebula was greatly improved.

T. D. ALLEN.

## EAR

**Rich, A. R.: A Physiological Study of the Eustachian Tube and Its Related Muscles.** *Bull. Johns Hopkins Hosp.*, 1920, xxxi, 206.

It is a matter of common knowledge that sudden changes in atmospheric pressure may so affect the ear drum that its proper functioning is disturbed. During the recent war interest in this subject was aroused because of the difficulties suffered by aviators.

The study reported in this article was begun at the suggestion of Howell in order to learn something of the action of the eustachian tube in protecting the ear drum. The author calls attention to three points of fundamental importance in any consideration of the physiology of the eustachian tube: (1) the physiological conditions under which the tube is open; (2) the muscles which influence its patency; and (3) the innervation of these muscles. In this article, however, only the first two of these points are considered.

Rich reviews the literature and describes the methods he employed in his experiments in more or less detail. His conclusions are as follows:

Normally the eustachian tubes are closed. They open during swallowing, yawning, and sneezing reflexes. They exhibit no independent reflex dilatations either periodic or irregular. Normally they are not opened by respiratory movements, either quiet or forced, and are unaffected by mouth-breathing or simple elevation of the soft palate.

Although a most important function of the eustachian tube is that of equalizing the atmospheric pressure on both sides of the tympanic membrane, the mere presence of a disturbed pressure equilibrium brings about no regulatory reflex dilatation of the tube, either independently or through the swallowing reflex. When necessary, deglutition is done consciously or through habit to restore pressure equilibrium, but this reflex is never set in motion directly by the stimuli arising from tension of the tympanic membrane.

The contractions of the levator palati, the palatopharyngeus, the internal pterygoid, and the superior constrictor muscle of the pharynx (each of which has been variously described as a dilator or constrictor muscle of the eustachian tube) exert no influence whatever upon the patency of the orifice or lumen of the tube.

The only muscle which is functionally related to the eustachian tube is the tensor palati. Contraction of this muscle is always accompanied by a dilatation of the tubal orifice and lumen. There is no constrictor muscle of the tube. Relaxation of the tensor palati is followed by a passive return of the tubal walls to the condition of approximation which they normally occupy when at rest. G. E. BEILBY.

**Whiting, F.: The Unreliability of Temperature in the Otitis of Infants and Children as an Indication for the Mastoid Operation.** *Surg., Gynec. & Obst.*, 1920, xxx, 364.

Notwithstanding increased temperature and more or less convincing local signs Whiting believes that in cases of mastoiditis in children operation should be postponed until there is a recognizable oedema of



the superior posterior segment of the membranous portion of the meatus with some infiltration and boggiess of the structures about the annulus. The dangers and difficulties attending this method of choosing the time for operation are more than outweighed by its advantages.

Of the dangers there is the extremely rare possibility of intracranial complications such as primary jugular bulb thrombosis with no external evidence whatever of mastoid inflammation. However, the structures between the mastoid cells and dura of infants are denser and more resistant than those lying between the mastoid and the periosteum. The squamomastoid suture is closed only by a fibrous or incompletely ossified tissue whereas the inner table is comparatively resistant. The incidence of epidural abscess in the mastoid cases observed by the author was only half as great as that of periosteal abscess. The epidural abscess of infancy is not commonly associated with such subdural complications as sinus thrombosis, cerebral abscess, or leptomenigitis. The outer surface of the dura only is overlaid with exudate and granulations, these constituting an effectual barrier against subdural infection.

Other difficulties attending this method of choosing a time to operate are the lack of corroborative assistance from laboratory methods and the difficulties of making a differential diagnosis between infant mastoiditis and lesser ear affections commonly complicating the diseases of infancy. The X-ray fails because the infant cannot be kept still and therefore the plate is obscured. Blood counts taken on successive days frequently contradict each other. The difficulty in making a differential diagnosis between a condition which involves the ear alone and conditions in which the ear is involved only secondarily is in great part due to the lack of a subjective history. Among the more common obscure ills are bronchopneumonia, central lobar pneumonia, influenza, gastro-intestinal disturbances, pyelitis, malaria, and the exanthemata.

J. D. Cook.

**Sautter, C. M.: The Technique of the Simple Mastoid Operation.** *N. York M. J.*, 1920, cxi, 1078.

In the simple mastoid operation all the mastoid cells should be exenterated. The technique of the operation is discussed under the following headings:

1. Preparation of patient. The hair should be shaved about the ear for a distance of 3 in., and the skin painted with a 50 per cent solution of iodine and alcohol and then wiped with 95 per cent alcohol. Stray hairs may be held by a narrow adhesive strip along the hair line.
2. Position of operator. The surgeon should stand at the patient's head.
3. Incision. The incision should be made from below upward. When necessary, greater exposure may be procured by making a posterior incision at right angles to the center of the first incision.
4. Elevation of periosteum.
5. Exposure of tip.
6. Exposure and outlining of triangle to learn position of antrum.
7. Removal of cortex.
8. Removal of tip.
9. Entering the antrum.
10. Removal of all cells: (1) tip cells; (2) suprasinus cells posteriorly and straight back from the superior canal line; (3) zygomatic cells; (4) infrasinus cells; and (5) postsinus cells.
11. Exposure of sinus or dura. Such exposure should be made at least as large as the little finger nail.
12. Packing with iodoform gauze.
13. Closure of upper two-thirds.
14. After-treatment. In the after-treatment the outer dressing should be changed the next day and the complete dressing on the third day. Subsequent daily packings should be inserted lightly. The wound should be closed in from three to six weeks.

O. M. Rorr.

# SURGERY OF THE NOSE, THROAT, AND MOUTH

## NOSE

**Reaves, R. G.: Nerve Blocking for Nasal Surgery.**  
*J. Am. M. Ass.*, 1920, lxxiv, 1514.

In order to produce anæsthesia in either nasal chamber only two points need be injected, namely, the exit of the nasal nerve from the orbit and the region of Meckel's ganglion.

To make an injection into the exit of the nasal nerve first instil a few drops of 4 per cent cocaine into the conjunctival sac to prevent pain when the needle is inserted. Then lift the upper lid upward and inward by placing the thumb at the inner and upper margin of the orbit, telling the patient to look outward. Insert the needle through the plica semilunaris just below the upper lachrymal puncta, directing it slightly inward and upward at an angle of about 30 degrees. The needle will soon strike the os planum, and when its point is moved up and down after it has been inserted about 3 cm. ( $\frac{3}{4}$  in.) it will engage in a groove the anterior end of which terminates in the anterior ethmoidal foramen. Here the nasal nerve leaves the orbit. Inject about 1 ccm. of a 1 per cent solution of procaine.

To make an injection into Meckel's ganglion brush the hard palate with a solution of cocaine along the root of the molars. Place the index finger on the hamular process of the internal pterygoid plate and bring it forward until a depression, the lower end of the posterior palatine canal, is palpated. Place the needle at an angle of about 45 degrees with the upper teeth and along the second molar, about  $\frac{1}{8}$  in. from its root. This brings it near the canal, which it will usually enter easily. When the needle is passed upward from 2.75 to 3.5 cm. (1 to  $1\frac{1}{4}$  in.), its point will be near Meckel's ganglion. Inject from 1 to 1.5 ccm. of a 1 per cent solution of procaine.

The injection of the nasal nerve is a very easy procedure. By careful manipulation it can readily be told when the needle is engaged in the groove near the anterior ethmoidal foramen. The injection of Meckel's ganglion is slightly more difficult. If the needle is placed a little too far back, it may pierce the soft palate, in which case the fluid will run down the nasopharynx. If it is placed forward, it may puncture a vessel on the hard palate and cause slight bleeding. The second molar is an excellent guide for the site of injection if it is borne in mind that the canal is close to the margin of the hard palate.

O. M. ROTT.

**Ittelson, M. S.: Conservative Nasal Sinus Surgery.**  
*N. York M. J.*, 1920, cxi, 1085

Two types of cases of suppurating sinusitis are discussed: (1) those with adequate drainage, and

(2) those in which drainage is imperfect. Even in the latter type conservatism is recommended as radical surgery is often disappointing. The author writes as follows: "Our knowledge regarding the underlying causes of sinus diseases is constantly changing. The accepted mode of procedure today will most likely be different tomorrow. Until more has been said on the subject and the results are more uniform many physicians will feel that the interest of the patient is best conserved when they refrain from operating until they have to, and then do as little as they can."

Among the minor surgical procedures which may be efficient and are well worth trying are puncture and irrigation of the antrum followed later, if necessary, by the formation of a larger opening with a Faulkner chisel. A high deflection of the septum causes the middle turbinate to press on the uncinate process or bulla, and thus to close the infundibulum. In such cases a submucous operation improves drainage and relieves the condition. An obstructive bulbous middle turbinate should be snared off. Suction, vaccine therapy, and treatment of the general condition may aid.

O. M. ROTT.

**Spencer, F. R.: The Treatment of Nasal Accessory Sinus Disease, with Special Reference to Surgery.** *Colorado Med.*, 1920, xvii, 156.

In the acute cases the author follows the treatment recommended by Hajek which consists of the following: (1) ten-grain doses of aspirin every four hours; (2) a sweat bath daily; (3) rest in bed; (4) the drinking of large quantities of water; (5) thorough cleansing of the intestinal tract; (6) light diet.

When the condition is more severe, local astringent applications are used, after which suction is applied and in some cases the middle turbinate is inflected.

In the chronic cases minor surgical work is preferred. In maxillary sinusitis the Caldwell-Luc operation may be performed after intranasal procedures have failed. Mosher's technique is preferred for ethmoidal disease. External surgery is rarely indicated in frontal sinus disease, but when necessary, Beck's method is of value. For opening the sphenoid, the author uses Andrews' knives or Sluder's hook.

O. M. ROTT.

**Reaves, W. P.: Ethmoidal Operations for Pan-Sinusitis Opening the Accessory Sinuses—Operative Danger Almost Nil, with Good Results.** *Laryngoscope*, 1920, xxx, 283.

The first step in ethmoidectomy consists of the removal of the middle turbinate, the vertical plate of the ethmoid with the superior turbinate, and the



lower half or two-thirds of the ethmoid cells. In most cases one or more of the superior ethmoid cells which are large enough to enable the operator to see the roof of the ethmoid have been opened. When he is unable to see the roof of the ethmoid he must penetrate to it by gently biting off the most pendulous cells, using the probe to see that the roof is always higher than the cell that is being removed. From this point he must follow up the removal of the ethmoid cells forward and backward or vice versa by means of a forceps adapted to engage the cells which are even higher than the nasal roof.

The forceps must be sharp enough to cut cleanly and prevent pulling or stripping of the mucoperiosteum. The operator should keep in mind that some of the cell attachment is thickened, sometimes almost a ridge forming the beginning of the cell wall. This is especially true at the juncture of the sphenoid and frontal bone forming the roof of the ethmoid. Safety in the removal of the high ethmoid cells lies in the use of forceps that are small enough not to crowd and sharp enough to cut cleanly, and in the removal of the cell proper and not its accessory wall of attachment at the roof. A good rule is to keep from 2 to 4 mm. from the roof of the cell. This will prevent trauma or stripping of the mucoperiosteum and cracking or perforation of the roof.

When a pathologic ethmoid is impacted against the septum, first remove the middle turbinate and enough of the ethmoid cells to probe the sphenoid, and then enlarge the sphenoid opening with punches, cutting upward and forward. Any ethmoid cells extending over the sphenoid and into the posterior ethmoid should be removed and a sufficient number of the cells should be removed to permit a view of the roof of the ethmoid

O. M. RORT.

### THROAT

**Gwathmey, G. T.: A Method of Anæsthesia for Adenoid and Tonsil Work. *N. York M. J.*, 1920, cxi, 1065.**

Gwathmey employs gas and oxygen passed over anæsthol for the induction of anæsthesia and gas-oxygen-ether to maintain it. His equipment consists of an electric heater for warming the anæsthetic and a vapor mask with Sanford nasal tubes or a mouth hook and a Whitehead self-retaining mouth gag.

Anæsthol is placed in one bottle of the ether attachment, and ether in the second bottle. The electric ether heater is placed between the ether attachment and vapor mask. The current is turned on at least five minutes before the operation is begun. Several layers of gauze are placed on the vapor mask and a towel wrung out in warm water is wrapped around it. One or two drops of oil of bitter orange peel are dropped upon the gauze to give the patient confidence and to cause him to breathe deeply. The induction of anæsthesia is begun with nitrous oxide through the third hole

and oxygen through the first hole of the sight feed. After fifteen to thirty seconds the anæsthol is turned on gradually. In from one to three minutes the third stage of anæsthesia has been reached, usually without a struggling stage. The ether is then turned on very gradually. If coughing occurs or there is the slightest hesitancy in breathing, the ether is turned off again and the anæsthesia is continued for a short while longer with gas-oxygen-anæsthol. The anæsthol stopcock is never turned on fully but just sufficiently to allow a small amount of the gases to pass through. After a short time the ether is again tried, this procedure being continued until the patient is able to breathe gas-oxygen-ether without coughing or hesitation in breathing. The anæsthol is then turned off and the anæsthesia continued with gas-oxygen-ether. Compared with the closed method in which a mask and bag are used, the method described is practically an open method in which gas oxygen is supplemented by small amounts of anæsthol or ether. The patient's skin remains pink throughout the procedure and there is no rise in the blood pressure at any time.

The change from the vapor mask to nasal tubes or mouth hook is not a change from one method of inducing anæsthesia to another as would be the case if a closed method were used.

The oxygen is increased in amount by allowing it to flow through the second hole. When in the case of an adult the patient shows signs that the anæsthesia is becoming lighter, the anæsthol may be turned on again for ten or fifteen seconds. In the cases of children up to 6 years of age the ether may be turned off very shortly after the operation is begun, the induction of the anæsthesia being carried through with gas oxygen only, or the gas may be turned off and the anæsthesia continued with ether and oxygen.

When the adenoids are being removed the nitrous oxide and the ether are turned off and oxygen is given through the third or fourth hole. When this is done the patient's skin remains very pink and the blood is in the best possible condition for coagulation. Another advantage is the fact that the rubber tubing from the ether container to the mouth tube is thoroughly flushed of ether vapor so that the next patient will get no unpleasant odors.

The mouth hook is used when nasal tubes interfere in any way with the technique of the operation. For instance, at one time during the author's work at St. Bartholomew's clinic the usual technique was to place the suction tubes in the throat through the nasal passages. The anæsthetic was given through the mouth gag. As either the nasal tube or the mouth hook is self-retaining, the anæsthetist is left with both hands practically free and is therefore able to assist the surgeon.

The technique as outlined is dependent upon team work and the synergistic action of the safest inhalation anæsthetics in common use today, i. e., nitrous oxide and oxygen, with small amounts of ethyl chloride or anæsthol as the initiatory anæ-

thetic, with nitrous oxide oxygen and ether at a low pressure as the terminal anæsthetic, a self-retaining mouth gag of the Whitehead pattern, the use of a tongue retractor instead of a depressor, a suction apparatus, and sponging, if indicated, the patient remaining in the same position as when the induction of anæsthesia was begun. O. M. ROTT.

### MOUTH

**Dachtler, H. W.: Alveolar Infections of Dental Origin As Seen by the Roentgenologist.** *Am. J. Roentgenol.*, 1920, n. s. vii, 302.

The diagnosis of alveolar infections of dental origin from the roentgenogram frequently offers difficulties because of anatomical variations in the teeth or mouth and mechanical drawbacks encountered in making the films. Single-angle films may fail to show abscesses which would be revealed in films made from different angles; hence positive results are exceedingly valuable but negative findings may be misleading. Correct interpretation of the film is the all-important consideration and is dependent upon the roentgenologist's judgment and experience.

Infections of the alveolar process produce the same changes that are seen in other infected bones and are subject to the same processes of bone atrophy, absorption, and repair. Infections occur ordinarily when a tooth is being devitalized, and therefore such a tooth should be carefully watched for some time afterward to see that it is not infected. Even slight changes extending from the apex up one side of the tooth and associated with very little bone destruction may be the cause of marked secondary manifestations. Partial examination of the teeth in medical cases is to be condemned inasmuch as patients whose teeth are apparently normal occasionally have a badly abscessed tooth when there is nothing in the history to indicate the condition.

ADOLPH HARTUNG.

**Erdman, S.: Calculi in the Salivary Ducts: Report of Five Cases.** *J. Am. M. Ass.*, 1920, lxxiv, 1447.

Calculi forming in the ducts of the salivary glands or in the glands themselves are of clinical interest because of the peculiarity of the symptoms and the frequency of the lesion. The diagnosis may be made usually from a carefully taken history of the symptoms, a visual examination of the mouth of the duct, and digital exploration of the floor of the mouth and

buccal cavity. Roentgen-ray examination is too often negative even when calculi are present as the technique of making pictures far back in the submaxillary and parotid regions is very far from perfect.

The calculi contain both organic and inorganic matter. When formed in the duct, they are usually oval or olive shaped, but when formed in the gland they are round or irregular. In color they are usually gray or yellowish, and in consistency they vary from hard to soft. Their surface is more often rough than smooth and may be grooved longitudinally. When multiple, the stones may be faceted. As a rule they weigh between 5 and 20 gm.

In the treatment of this type of case there are two methods which may be used after the induction of local anæsthesia in the vicinity of the duct. By one method a probe is inserted and the duct spread back as far as necessary to deliver the calculi. The delivery may require the use of a spoon or curette. By the other method a direct incision is made through the mucous membrane and into the duct at the site of the previously located stone, into the distended duct behind the stone, or on a probe in the duct. If the stone has slipped back and cannot be found, the splitting or incision of the duct may be followed by its spontaneous delivery within a few days without further intervention.

A search should always be made for multiple stones. The results of treatment are satisfactory if the obstruction is removed. Recurrence is very rare unless some of the calculus has been left. External incisions are seldom indicated. I. W. BACH.

**Turner, H. W.: Chronic Infective Osteitis of the Maxillæ in a Male Aged 40.** *Proc. Roy. Soc. Med.*, Lond., 1920, xiii, Sect. Odont., 64.

Turner reports a case of enlargement of the right maxilla in the molar region of twelve years' duration which gradually extended along the whole alveolar region of both maxillæ. Examination revealed massive hypertrophy of the maxillæ confined entirely to the alveolar region.

All teeth were removed under general anæsthesia. After six months the lips and cheeks were less stretched and the lines of the face more marked.

Later large quantities of easily cut, friable, and granular bone were removed from the growth. The report based on a study of the cut sections stated that the condition appeared to be an inflammatory hyperplasia. LOUIS SCHULTZ.



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# INTERNATIONAL ABSTRACT OF SURGERY

NOVEMBER, 1920

## ABSTRACTS OF CURRENT LITERATURE GENERAL SURGERY—SURGICAL TECHNIQUE

### OPERATIVE SURGERY AND TECHNIQUE

Bailey, C. F.: The Removal of Metallic Foreign Bodies by Surgical Operations under Direct X-Ray Control. *Lancet*, 1920, cxcix, 125.

The author highly recommends the removal of foreign bodies under direct X-ray control and states that this method is easy and sure, that the average time of operation is appreciably reduced, and that the after-results are excellent. X-ray plates and surface markings do not always give satisfactory information with regard to the location of foreign bodies, as evidenced occasionally by severe damage in the form of excessive scar tissue and disability resulting from unsuccessful search. Consultation of the surgeon with the radiologist prior to operation may overcome some of the difficulties.

The essentials of a suitable equipment for direct-control operations are: (1) freedom from the possibility of shock to the patient or bystander, (2) X-ray protection for all, and (3) rapidity and ease in the manipulation of the apparatus. The main points of distinction in the apparatus are: (1) a simple five-ply, wood-topped table, with nothing whatever attached, (2) a light oak tube-stand on the opposite side of the table controlled by the radiologist who stands by the surgeon's side, and (3) satisfactory X-ray protection.

A large, well-lighted, well-ventilated room with dark-red walls is desirable; ventilation may be obtained after operations. Artificial light and light-proof blinds are necessary. One powerful, shaded, movable electric light should hang over the table for the surgeon, a weaker, shaded light should hang beside it as a substitute, and another weak light should be provided for the anæsthetist. The use of red-glass goggles has been advised, but is not practical.

The objections raised to the procedure are based on: (1) inability to see anything on the screen, (2) the danger of operations with the screen, and (3) inability to maintain asepsis. H. W. HUNDLING.

Williamson, H.: A Note on the Value of Blood Transfusion before Operation in Severe Secondary Anæmias. *Proc. Roy. Soc. Med.*, Lond., 1920, xiii, Sect. Obst. and Gynæc., 149.

The author reports a case of uterine fibromyomata complicated by severe uterine hæmorrhage of six weeks' duration. At the time the case was received at the hospital for operation the red blood cells numbered 1,670,000 per cubic millimeter and the white cells, 52,000 per cubic millimeter, while the hæmoglobin amounted to only 22.5 per cent. The patient was very restless and breathless; the pulse was 130 and of poor volume; the temperature, 101° F.; the tongue, dry and furred. Incontinence of both urine and fæces was associated with frequent vomiting.

For six days following the patient's admission to the hospital her general condition continued to become much worse, the red blood count falling to 845,000 per cubic millimeter. On the sixth day 600 ccm. of citrated blood were transfused into the median basilic vein. The effect was most decided. Three days later the temperature was normal, the vomiting had ceased, and control over the bladder and rectum had returned. The red cells had risen to 3,485,000, and the white cells had fallen to 29,000 per cubic millimeter.

Fifteen days later, the patient's general condition being greatly improved, a subtotal hysterectomy was performed with the removal of the tubes and ovaries. This was followed by an uninterrupted recovery and the patient left the hospital quite well at the end of three weeks. On the day of her discharge the red cells numbered 4,250,000 and the white cells, 10,400.

The author suggests that blood transfusion should be performed before delivery in cases of severe antepartum hæmorrhage and before operation in all cases in which there is a very severe anæmia as it diminishes the risk of the operation, lessens the liability to thrombosis, and shortens the period of convalescence.

CARL H. DAVIS.

**Power, D.: The After-Treatment of Some Surgical Cases.** *Practitioner*, 1920, cv, 1.

Power deals with the after-treatment of surgical cases with regard to vomiting due to the anæsthetic, pain, drainage, sutures, and diet.

**Vomiting due to the anæsthetic.** The odor of ether may be lessened by the use of eau-de-Cologne and water on a handkerchief or sprinkled on the beard or mustache. The taste may be reduced by means of a mouth wash of carbolate of soda (phenol, 8 parts, caustic soda,  $3\frac{1}{2}$  parts, distilled water,  $88\frac{1}{2}$  parts, diluted ten or twenty times) or a mixture of 6 gr. of phenol and 5 gr. of citric acid to an ounce of eau-de-Cologne, diluted to 2 oz. with warm water. Severe vomiting may be controlled by giving sips of hot water or, in more severe cases, hot water containing 15 gr. of soda bicarbonate. This will afford relief even though it may be vomited immediately. At times nothing should be given by mouth. In such cases a sedative enema consisting of 20 gr. of potassium bromide, 20 gr. of chloral hydrate, and 2 oz. of mucilage of starch may be administered and the stomach washed out with a stomach tube. Sometimes after prolonged vomiting it may be better to give solid food instead of liquids.

**Pain.** The pain usually felt after an operation is due to gas rather than to the operative wound. One-hundredth of a grain of hyoscine hydrobromide may be given before the operation or  $\frac{1}{4}$  gr. of morphia before the patient leaves the table. The dressings and the wound should always be carefully examined whenever pain is present. In most cases 15 gr. of aspirin will be sufficient to afford relief. The same dose may be repeated in four hours. Because of its masking effect, the author does not give morphine unless it is absolutely necessary. When it is indicated, however, he gives  $\frac{1}{2}$  gr. in one dose, believing this better than two doses of  $\frac{1}{4}$  gr.

**Drainage.** If a drainage tube is employed it should be sufficiently large so that it will not become blocked by secretions. When the wound is expected to heal by first intention, the tube should be removed at the end of twenty-four or forty-eight hours. It must not be left in place too long for as soon as adhesions are formed around it, its work is completed. It should then be replaced with a light gauze packing. After its removal the incision through which it passed should be treated in the same manner as the rest of the wound.

**Aperients.** The aperient of choice is castor oil (6 to 8 dr.) supplemented, when necessary, by a soap and water enema. When the patient objects to oil, 2 or 3 gr. of calomel with  $\frac{1}{2}$  gr. of powdered opium may be given to prevent griping, or 1 gr. of calomel hourly for five hours if necessary. White mixture is the most satisfactory routine aperient during convalescence.

**Sutures.** Sutures are usually removed seven days after their insertion, but in lesions of the face they should be taken out on the third or fourth day, and in cases of intussusception, between the tenth and

the fourteenth days. They should be removed with great care in order that the scar may not be put to undue tension. Silkworm-gut and horsehair are the suture materials most frequently employed.

**Food.** Milk is a solid rather than a liquid and therefore should be used with discretion. If necessary it should be predigested. Milk is not a satisfactory food after operations for hare-lip or cleft palate unless care is taken to cleanse the mouth after each feeding. Following a gastro-enterostomy no leakage occurs after seventeen hours, but nothing should be given for twenty-four hours. Thirst may be controlled by salt solution given by rectum. At the end of twenty-four hours dram doses of whey should be given every half hour for three hours, and then 1 oz. or a little weak tea every hour for three hours. The quantity may then be increased to 5 oz. every four hours. At this time essence of glucose or similar foods may be substituted. The principle of this régime is to allow food to trickle through the stomach without distending it. Vomiting is an indication that all feeding should be stopped. When it is resumed, smaller quantities should be given.

IRWIN W. BACH.

**Hammer, A. W.: Vomiting from a Surgical Viewpoint.** *N. York M. J.*, 1920, cxii, 64.

Hammer considers vomiting an important symptom in the syndrome of many of the major surgical maladies. He discusses it first in connection with acute or chronic cerebral lesions. Vomiting due to cerebral conditions may occur when digestion is at its height and closely simulate a case of indigestion, as in a sudden apoplectic seizure. When sudden vomiting with or without nausea occurs in a middle-aged person or a patient of advanced age and there is no evidence of gastric involvement, the emesis being painless and the ejected matter composed of mucus or a watery fluid, the possibility that cerebral hæmorrhage is a causative factor should be considered.

Vomiting is frequently associated with exophthalmic goiter and in such cases is believed to be partly of nervous origin. Intractable vomiting occurs frequently in biliary colic and often no other symptom save epigastric pain is present during the first twenty-four or forty-eight hours.

The primary nausea and vomiting of acute appendicitis is reflex in character and manifested early in the disease. Almost invariably it is the second symptom, pain being the first. It is the result of an overdistended condition of the appendix caused by the retention of infected matter in that portion of the gut. Secondary nausea and often persistent vomiting are due to peritoneal involvement.

Vomiting is an early symptom of acute peritonitis and frequently continues throughout the course of the disease. With the decrease of peristalsis and intestinal absorption, putrefactive changes occur and the bowels become overdistended with gas. As a result of reversed peristalsis, which represents an effort on the part of the bowels to overcome the distention,



the contents of the upper intestine are forced into the stomach to be finally disposed of by vomiting.

The importance of vomiting as a cardinal symptom is well illustrated in certain cases of hernia in which abdominal pain and vomiting are the only two symptoms which attract attention. In every case of vomiting associated with abdominal pain, therefore, a careful examination should be made for hernia as the symptom may be due to the incarceration of a small knuckle of the intestines in a hernial sac. In strangulated hernia vomiting is an early and serious symptom. At first it is reflex in character, but later becomes regurgitant.

In intestinal obstruction first the stomach contents are vomited, then the bile, and finally the duodenal contents. In the beginning the vomitus is odorless but a few days later it becomes faecal in nature. A lesion in the upper part of the small intestine is characterized by the rapid oncoming of vomiting of a violent and expulsive nature, while in obstruction of the large intestine there may be eructations of gas without vomiting or vomiting is a later symptom which generally follows tympanites. The faecal nature of the vomitus in obstruction of the large intestine may be ascribed to the regurgitated matter from the upper bowel as there is no evidence that the contents of the large intestine are ever vomited. In intussusception, faecaloid vomiting is exceptional.

Regurgitant vomiting following the operation of gastro-enterostomy is due to several causes, prominent among which are too free and careless handling of the intestine, a kinking of the bowel at the point of anastomosis, and too firm pressure due to faulty clamping. Because of improvements in surgical technique and the better understanding of abdominal surgery, this deplorable sequela is much more rare today than formerly.

Diseases, deformities, and malpositions of the female generative organs may give rise to a series of symptoms, not the least conspicuous of which, in many instances, are nausea and vomiting.

The author suggests that when the causes of vomiting are not plainly indicated, an investigation should be made of every organ and bodily function.

GEORGE W. HOCHREIN.

**Gabriel, W. B.: Hæmorrhage following the Operative Treatment of Internal Hæmorrhoids, with Particular Reference to Severe Secondary Hæmorrhage.** *Lancet*, 1920, cxcix, 121.

The author bases his paper on an analysis of 500 cases of internal hæmorrhoids in which operation was performed at St. Mark's Hospital. Ligation operations were done in 470 instances, 18 patients were treated with the clamp and cautery, and the Whitehead operation was done in 12 cases.

The three patients with intermediate hæmorrhage were treated by plugging the rectum and were given morphine to keep them quiet.

Severe secondary hæmorrhage, which is an uncommon complication, occurred in 5 cases, in all of

which a ligation operation had been done. Slight secondary hæmorrhage occurred in 8 cases, in 7 of which a ligation operation had been done. The average date of hæmorrhage was the seventh day after operation. The usual causes were infection, trauma, anæmia, and general debility, and, to a less extent, blood diseases such as hæmophilia.

The symptoms produced may be very slight. The most common sign is a trickling of blood from the anus. The patient should be confined to bed and carefully watched for any general signs of hæmorrhage as the quantity of blood escaping is not an index of the real amount of bleeding. If signs of severe hæmorrhage are present a tubular speculum should be passed and the exact amount of hæmorrhage determined.

The most satisfactory treatment consists in washing out the rectum with warm saline or lysol solution and then plugging it by passing a rubber tube with a "surround," as described by Lockhart-Mumery. The tube is removed on the following day and 5 oz. of sterile oil are injected into the rectum; the bowels are kept open by suitable aperients.

The author believes that by the treatment outlined in this article the most severe secondary hæmorrhages following operations for hæmorrhoids can be controlled successfully.

G. S. FOULDS.

#### ASEPTIC AND ANTISEPTIC SURGERY

**Norton, J. F.: Soaps in Relation to Their Use for Hand Washing.** *J. Am. M. Ass.*, 1920, lxxv, 302.

The Food and Drugs Act of 1906 does not prohibit advertising or the issuing of circulars which contain fraudulent claims as to the desirable qualities of foods or drugs. It is applicable merely to the package or container. The same ruling applies to soaps. Soaps are now advertised as being "antiseptic for wounds, etc., including cancerous infections and for bathing in contagion."

Chemical tests have shown that certain soaps are free from bacteria and that when they are rubbed over the body the skin is rendered sterile.

The "phenol coefficient" is supposed to be the gauge of the antiseptic power of soap. While admitting that soap solutions in sufficient concentration are antiseptic, though not germicidal, the author questions the value of the phenol coefficient as there is a great difference between the laboratory tests and the actual use of the soaps.

According to certain army statistics influenza was more prevalent among groups of persons who washed their dishes in a common receptacle, and it may be concluded therefore that the bacteria were transmitted from the hands of one person to those of another through the medium of the dish water.

Different observers have found most of the common pathogenic organisms on the hands of patients, carriers, and hospital attendants.

To date, the only experiments on the actual antiseptic properties of soap in hand washing were those made by Symes in 1899. Symes found that solu-



tions of soap with biniodide of mercury would kill suspended cultures of bacteria, but that ordinary washing with mercuric iodide soap does not sterilize the hands.

In the author's experiments he attempted to determine:

1. The relative efficiency of various soaps in removing bacteria from the hands.
2. The relative germicidal power of the soap solutions obtained in washing toward bacteria removed from the hands.
3. The bacterial condition of the hands after washing, i.e., whether they were sterile or not.
4. The effect, if any, of the soap remaining on the hands, the action of different soaps in this respect being compared.

The experiments were carried out with twelve different soaps picked at random and varying from the cheapest toilet soaps to the expensive so-called "antiseptic" and "germicidal" soaps. The experiments were made during various seasons of the year on students and members of a laboratory staff. Different methods were used which included in general the rinsing of the hands in sterile water and then the counting of the bacteria or groups of bacteria present. Cultures and platings also were made.

The conclusions drawn from these experiments are as follows:

1. The hands are not rendered sterile in the ordinary process of washing. More bacteria are removed by the ordinary toilet soaps than by the special soaps. In other words, the cleansing properties of a soap are more important than its germicidal or antiseptic constituents.
2. The soap solution obtained in hand washing is of no practical germicidal or antiseptic value.
3. In the whole process of hand washing done in the usual manner the special so-called "germicidal" or "antiseptic" soaps exhibit none of the special properties ascribed to them.
4. Since the hands may serve as a medium for the conveyance of bacteria in infectious diseases, it is important to render them as sterile as possible. For this purpose the ordinary toilet soaps are as effective, if not more effective, than the special brands of so-called "antiseptic" or "germicidal" soaps.

MARCUS H. HOBART.

### ANÆSTHESIA

**Wehner, E.: The Effect of Anæsthetics on Inflammation; Therapeutic Experiment in Erysipelas** (Zur Beeinflussung der Entzündung durch Anaesthetie; therapeutischer Versuch beim Erysipel). *Zentralbl. f. Chir.*, 1920, xlvii, 569.

Clinical observations by Spiess, Wilms, and others have demonstrated that inflammation does not occur following subcutaneous anæsthetization of the peripheral sensory nerves. This fact has been confirmed experimentally by Bruce. Breslauer observed further that the Pirquet reaction is delayed and weakened by the subcutaneous injection of novo-

caine. On the basis of these findings Wehner injected a 1 per cent solution of novocaine and adrenalin in a case of erysipelas, making the injection around the border of the inflamed skin on one side only. On this side the spread of the erysipelas was checked, whereas on the side which was not anæsthetized it advanced over the sound skin. In the author's opinion such injections may prevent also the subcutaneous spread of the inflammation in erysipelas.

HARMS (Z).

**Cattell, M.: Experimental Studies on the Effects of Anæsthetics in Shock.** *Am. J. Surg.*, 1920, xxxiv, Anæst. Supp., 89.

From the results of experiments on over 150 animals Cattell draws the following conclusions:

1. In the normal animal ether rapidly administered causes a moderate fall in blood pressure, which is followed immediately by recovery so that by the time a degree of anæsthetization sufficient to cause the disappearance of the eye reflex is reached the pressure is normal. In shock the animal becomes very sensitive to ether, the same degree of anæsthesia produced under similar conditions resulting in a marked drop in the blood pressure.
2. Sensitiveness to ether is increased by any factor, such as low blood pressure, hæmorrhage, severe operation, or the injection of acid into the circulation, which tends to depress the animal's general condition.
3. In a shocked animal sensitive to ether the same degree of anæsthesia may be obtained with nitrous oxide and oxygen as is produced by ether without a fall in the blood pressure.
4. Studies of the heart volume in cats, contractions of the isolated turtle heart, and deductions from blood-pressure determinations show that from the very beginning of its administration ether causes a depression of the heart and an increase in its output which is sufficient to account for the fall in pressure in both the normal and the shocked animal.
5. Large doses of adrenalin injected intravenously into shocked animals usually cause the disappearance of the sensitiveness to ether for a period of an hour or more. This evidence indicates that adrenalin counteracts the effects of ether. Pituitrin does not influence the pressure drop produced by ether in the shocked animal.
6. Determinations of leg volume with a plethysmograph, perfusion experiments, the results obtained from the injection of ether directly into the circulation and blood pressure curves indicate that ether causes a contraction of the peripheral vessels in the normal animal. This contraction is due to: (1) direct stimulation of the vasomotor center, and (2) a reflex to the fall in pressure resulting from depression of the heart. In shock no evidence of a vasoconstriction produced by ether has been obtained, and pressor effects from asphyxia or sensory nerve stimulation become less or are entirely absent.
7. The greater depressing influence of ether on the blood pressure in shock is due to a disturbance of



the vasomotor system. The usual compensatory constriction no longer occurs to offset the decreased output of the heart, so that there is no recovery of the blood pressure during the inhalation of ether but, instead, the pressure continues to fall. This might be due to a depression of the vasomotor center or maximum constriction.

ISABELLA C. HERB.

**Eastman, J. R.: The Advantages of Local Anæsthesia in Thyroid Operations.** *J. Am. M. Ass.*, 1920, lxxv, 166.

Among the chief dangers of general anæsthesia in goiter operations are: (1) postoperative pneumonia; (2) overtaxing of the heart; (3) overtaxing of the kidneys; (4) failure to block sensory nerve paths which results in the needless consumption of nervous energy, as explained by Crile; (5) injury of the recurrent laryngeal nerve; and (6) asphyxia.

Advantages of local anæsthesia from the standpoint of operative technique are:

1. More perfect hæmostasis may be obtained through the use of suprarenal extract in non-toxic cases.

2. Dissection of the skin flap may be performed more easily and more quickly because of the thickening of the panniculus adiposus from inhibition of the solution.

3. The gland may be delivered more easily because of the elevation of the lobes on the water-bed and the thickening of the capsule.

4. As the patient is able to speak, the operator has a constant check on such factors causing exhaustion as the pressure of instruments on the vital structures of the neck which results in discomfort if not direct embarrassment of respiration and circulation with asphyxia.

5. The patient is able to inform the operator at all times whether his head and neck lie in a comfortable and therefore a correct and safe position.

6. Local anæsthesia demands gentle manipulation of the tissues which minimizes pressure on the gland with its danger of over-activation of the heart, as proved by Cannon.

7. Postoperative nausea, vomiting, and strangling, with the attendant risk of bleeding, are practically eliminated.

8. The patient is able to take liquids by mouth immediately after the operation and therefore the necessity for proctoclysis, which is annoying to excitable toxic patients, is eliminated.

HOWARD A. MCKNIGHT.

**Silk, G. F. W.: A Modification of the Open Ether Method.** *Am. J. Surg.*, 1920, xxxiv, Anæst. Supp., 82.

The disadvantages attending the use of ether alone are:

1. The period of induction is prolonged.  
2. Nearly all patients object to the taste and smell of pure ether.

3. In the cases of over-robust and alcoholic patients complete muscular relaxation appears to be difficult or impossible of attainment.

4. The amount of ether used is often excessive.

5. The flow of mucus and saliva may be excessive.

Usually the anæsthetist seeks to overcome these difficulties by beginning with a little chloroform or some mixture of chloroform and ether (equal parts of chloroform and ether, 1 part of chloroform and 2 parts of ether, or 2 parts of chloroform and 3 of ether). This is generally administered upon the mask used for the ether alone, that is, twelve to sixteen layers of gauze with an under-lying face pad. Pure ether is substituted as soon as it is thought that the patient will no longer object to the change. In many, perhaps in the majority, of instances this plan succeeds well enough for all practical purposes, but in rather a large number of cases a tendency to respiratory cardiac failure develops in the course of two or three minutes after the change to pure ether has been made. The author believes also that in some cases death has resulted.

As explaining this untoward outcome it has been suggested that the face pad and thick layer of gauze or lint used in the open ether process do not permit a sufficient dilution of the vapor with air, and that when the gauze is wet with the heavy, semi-viscid, chloroform liquid an almost impervious or closed system is formed, with momentary accumulations of dense chloroform vapor immediately over the mouth. It is quite clear, therefore, that if chloroform or one of the strong mixtures is used for the induction of the anæsthesia, an entirely separate and much thinner mask should be substituted for the face pad and the patient carefully watched for the faintest indication of respiratory or other failure. Slight as these changes are, however, they suffice to rob the open ether process of its simplicity and therefore are seldom adopted.

Silk experimented with various combinations of chloroform and ether and decided that the best is a mixture of 1 dr. of chloroform and 32 dr. of ether, which is approximately 3 per cent of chloroform in ether. This mixture he uses exactly as if it consisted of ether alone, the presence of the small quantity of chloroform being ignored.

Its advantages are that it is simple, safe, easily and rapidly administered, non-irritating, efficacious, and cheap.

It is obvious that the possibilities of over-dosage with chloroform are diminished when the  $\frac{1}{2}$  dr. required for induction is diluted with 2 oz. of ether and is given during ten instead of two minutes. From 1 to  $1\frac{1}{2}$  dr. of chloroform used in the course of an hour is not apt to do much harm.

ISABELLA C. HERB.

**Quain, E. P.: A Mixture of Ethyl Chloride, Chloroform, and Ether for General Anæsthesia—An Experience in War Surgery.** *Am. J. Surg.*, 1920, xxxiv, Anæst. Supp., 79.

General anæsthesia induced by a mixture of ethyl chloride, chloroform, and ether was employed by the author with very satisfactory results in

Evacuation Hospital No. 114 in France. The method was developed by French surgeons earlier in the war, but apparently very few American surgeons became familiar with its possibilities.

Nitrous oxide gas was seldom used at this hospital because: (1) it was not always obtainable; (2) the apparatus was often out of repair; and (3) there were few skilled anæsthetists available.

Ether was found to have several drawbacks in war surgery for acute conditions. The time required by the anæsthetist to put the patient to sleep was usually a total waste for the rest of the operating team. A quicker anæsthetic would greatly increase the surgical out-put of the team and incoming patients would receive treatment earlier. Many patients came to operation soon after eating, and distressing and dangerous vomiting was a frequent result of anæsthetization by ether. Moreover, many of the wounded suffered from "colds," tonsillitis, bronchitis, and influenza. Another objection to the use of ether was the fact that following anæsthesia induced by this agent the patient was obliged to occupy a hospital bed a certain length of time before he could be evacuated — an important fact when the number of incoming wounded patients exceeded the number of beds.

The ethylchloride mixture had decided advantages over ether in all of these respects. Savariaud's mixture was adopted. This consists of 5 ccm. of ethyl chloride, 1 ccm. of chloroform, and 24 ccm. of ether mixed in a small bottle for each anæsthesia. A piece of dry flannel is laid over the patient's face and over this is placed a second piece of flannel soaked with the entire 30 ccm. of the solution. A mask of rubberized cloth is quickly fastened over the face with a puckering string and the patient directed to breathe. A small opening in the center of the mask admits air as needed.

Unconsciousness comes quickly and the operation is begun within one minute. There is no waiting between operations. The anæsthesia from the dose given lasts from fifteen to twenty minutes but may be prolonged by changing to ether. After the removal of the mask the patient wakes up promptly. Most patients who had walked to the operating table walked away from it after a ten or fifteen minute operation. There is no mucus in the throat and seldom any nausea. Emesis, if it occurs at all, comes after the operation.

There was no death from the anæsthesia, no syncope, and rarely any cyanosis. Struggling occurred occasionally at the beginning of anæsthesia but was never serious.

The mixture described was used in 400 cases, the majority of which were injuries of the extremities. It was the anæsthetic of choice for operations requiring less than twenty minutes, the surgeon's speed determining its scope of usefulness. It was not employed for surgery within the cranium, thorax, or abdomen.

The method is worthy of consideration in civil emergency surgery.

## SURGICAL INSTRUMENTS AND APPARATUS

**Brunner, A.: Low Pressure Breathing in Practical Surgery** (Die Unterdruckatmung im Dienste der praktischen Chirurgie). *Deutsche Ztschr. f. Chir.*, 1920, clii, 107.

The author describes an apparatus with which it is possible to lower the intrathoracic pressure gradually. Because of the increased flow of blood to the thorax during inspiration the respiratory blood pressure variations during respiration are much greater with low pressure than with atmospheric pressure. During low pressure breathing the arterial pressure is raised whereas during high pressure breathing it sinks. By low pressure breathing is meant a decreased pressure within the respiratory area with atmospheric pressure on the surface of the body. Experiments have shown that parenchymatous bleeding practically stops with low pressure breathing.

A drawback to the use of the method is the danger of air embolism. Operations upon the skull, in the region of the large veins of the neck, or any area where veins cannot collapse are therefore contraindicated under low pressure breathing. If the larger vessels are ligated the danger of hæmorrhage is small. Low pressure breathing is recommended for exsanguinated patients because, with the addition of oxygen, the lung capillaries and veins dilate and the heart chambers fill more easily.

In low pressure breathing the blood volume is displaced from the extremities to the thoracic space and the diaphragm rises higher during expiration than it does with atmospheric pressure. Because of the decrease in the size of the chest cavity an enlargement equal in capacity to 1 liter occurs in the abdominal cavity. This increased amount of space may be of considerable value for the replacement of the bowels during an operation for ileus. As a result of the lower pressure above, a part of the gases from the abdominal organs will escape by way of the pharynx. Therefore, small amounts of gas may be aspirated during anæsthesia. To prevent this the patient should be placed in the Trendelenburg position.

FRANGENHEIM (Z).

**Marshall, H. W.: A Ready-To-Wear Brace for Strained Muscles and Ligaments.** *Boston M. & S. J.*, 1920, clxxiii, 98.

In a short article the author explains the advantage of having braces ready to wear directly after an injury. The pathology which takes place in a torn muscle or ligament is well considered and described. The advantages of early treatment with a proper mechanical appliance which immobilizes the parts but can be removed for massage, exercise, and external applications before serious changes have taken place in muscles and ligaments are discussed.

Ready-to-wear braces are especially valuable in cases of low spinal injuries and are preferable to plaster, adhesive strapping, abdominal supports,



rest in bed, or waiting for the manufacture of a brace.

The author has some fifteen spinal supports differing in weight, strength, and size which can be applied at once and afford great relief. These braces are made to fit the patient by bending them with a wrench and may be used on different persons.

Similar principles may be employed in the manufacture of ready-to-wear braces for injuries to the neck, hips, elbows, wrists, ankles, and feet. Great relief is given by the early application of correct apparatus, and the apparatus described is much less expensive than the ordinary manufactured supports.

CARL C. CHATTERTON.

## SURGERY OF THE HEAD AND NECK

### HEAD

**Lenormant, C., and Soupault, R.: Tuberculosis of the Cranial Vault** (*La tuberculose de la voûte crânienne*). *Presse méd.*, Par., 1920, xxvii, 494.

The authors have observed 2 cases of tuberculosis of the cranial vault within one year. They believe that the affection occurs more frequently than is commonly believed. In 1910 Pelletier collected and tabulated 206 cases from the literature.

Cranial tuberculosis is seldom primary; it is almost always associated with lesions of other bones or lesions of the lungs, and in very rare instances with a meningeal or cerebral tuberculosis. The patients are usually young. While any of the bones of the head may be affected, the disease is found usually in the frontal or parietal regions. Pelletier's collected cases included 78 frontal and 76 parietal lesions but only 15 temporal and 18 occipital lesions. The lesion generally originates in the abundantly vascularized spongy portion of the bone and spreads to the internal and external surfaces. The two tables are invaded simultaneously but not usually to the same extent, the deeper surface being more deeply invaded.

Cranial tuberculosis may evolve in either of two forms: as a perforating tuberculosis or as a progressive infiltrating tuberculosis. The authors consider the term "perforating tuberculosis" inexact, believing that the condition to which it is applied should be designated as "circumscribed tuberculosis."

In the circumscribed form the lesion may involve the external table only or may spread extracranially or intracranially. As a rule the infiltration forms fungosities between the inner table and the dura mater, and at times an extradural tumor is formed.

Progressive infiltrating cranial tuberculosis is characterized by the extensive progress of the disease. First the extradural region is rapidly involved and then the exterior where the condition is manifested in the form of abscesses. While it is generally considered that this form of cranial tuberculosis results from a progressive infiltration of the bony tissue by the infection, the authors are inclined to the opinion that the propagation occurs through the fungosities between the bone and the dura rather than through the bone.

There are three phases in the clinical evolution of cranial tuberculosis before the appearance of the

external abscess. First there is localized pain which is elicited especially on pressure, then a hard tumor, and finally, after the periosteum has been perforated, a fluctuant tumor. The presence of such a fluctuating abscess is an infallible diagnostic sign as in no other affection is an extracranial collection of fluid formed without acute reactional phenomena. After opening of the abscess fistulization occurs.

Cranial tuberculosis is rarely associated with cerebral symptoms due to compression or irritation of the meninges. In the 206 cases collected by Pelletier such symptoms were observed in only 4 instances and there were only 9 cases of meningeal, and 4 cases of cerebral tuberculosis.

The prognosis depends both on the presence of complicating bacterial lesions and the anatomical form of the tuberculosis. If the tuberculosis is primary and circumscribed and if proper treatment is given the prognosis is always favorable.

The only efficacious treatment of tuberculosis of the cranial vault is complete excision of the affected tissues. The osseous resection should surpass the limits of the infiltration and all extradural fungosities should be carefully curetted. When the area is circumscribed the operation is simple and only slightly mutilating. In the infiltrating form an extensive craniectomy and resection are indicated. Repeated operations are often necessary to prevent recurrences and obviate the formation of fistulae. In 1 case reported by Israel the patient was subjected to 35 operations in seven years.

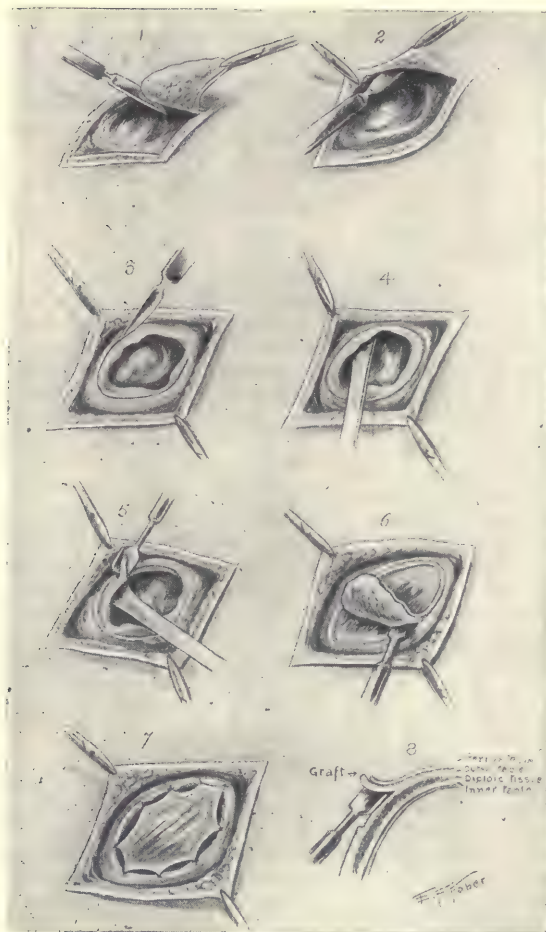
Pelletier's statistics included 76 cases of cranial tuberculosis treated surgically. In these there were 52 complete recoveries, 8 recoveries with fistula, and 16 deaths.

The two cases reported by the authors were: (1) a case of circumscribed parietal tuberculosis on the right side in a woman 35 years of age; and (2) a case of infiltrating tuberculosis of the right parietal region in a man 28 years of age. Both patients recovered after operation, but in the second case a recurrence has developed and the prognosis is very unfavorable.

WILLIAM A. BRENNAN.

**Coleman, C. C.: The Repair of Cranial Defects by Autogenous Transplants.** *Surg., Gynec. & Obs.* 1920, xxxi, 40.

This paper is based on a series of 208 cases of head injuries treated in the U. S. General Hospital No. 11. Of these cases 5 were operated on for cranial defects.



1. Excision of scar from defect.
2. Exposure of rim of defect by incision through scar.
3. Incision through pericranium about  $\frac{1}{4}$  in. from the edge of the defect. The purpose of the incision is to provide for bone contact with the graft and to free the adherent dura.
4. The pericranium within the incision, 3, is forcibly displaced within the defect by an elevator. Adhesions of the dura to the edge of the bone are thus freed.
5. Beveling the edge of the defect for contact with the graft. The dura is carefully protected by a thin spatula.
6. Removal of the transplant from the parietal eminence. The size and shape of the transplant have been modeled by a rubber dam and the graft has been cut to fit accurately.
7. Graft partly sutured by uniting the pericranium of the graft with that surrounding the defect.
8. Cross section of graft.

After structural changes had taken place, cranioplasty did not appreciably improve the symptoms. Cranioplasty was done to protect the brain and relieve the deformity.

In defects of moderate size without intracranial tension the defect receded when the head was higher

than the rest of the body and protruded when the patient was recumbent or stooping. The symptoms were most pronounced when the patient was lying down.

The method of cranioplasty employed in these cases was that used by Frazier. The scar tissue was removed by incision which followed the old scar, and the dura was freed from the bony rim with care not to open the dura. A pattern of the defect having been made and outlined on the parietal eminence with a fine chisel, a thin lamina of the outer table with the overlying pericranium was removed. The transplant was placed over the defect, with the bony surface down, and held by fine interrupted catgut sutures. The patient was kept flat in bed for two weeks.

ISADORE E. BISHKOW.

**Sachs, E.: A Review of Eight Years' Experience with Brain Tumors.** *Arch. Surg.*, 1920, i, 74.

The highest mortality due to brain tumors, about 35 per cent, occurs in cases of glioma. This type of case may be characterized chiefly or entirely by focal symptoms, general signs of pressure being absent even though the tumor may be large. In spite of the absence of pressure symptoms, however, a diagnosis of brain tumor is possible. Early operation is most important.

Gliomata are frequently regarded as malignant tumors. This is not correct. One of the chief characteristics of a malignant tumor is its power to form metastases, a power which the glioma does not possess. In cases of brain tumor palliative measures should not be continued for more than four weeks, and every brain tumor should be treated on the assumption that it may be a glioma and requires hospital care.

Gliomata differ from other brain tumors in three respects: (1) their growth is more rapid; (2) they are very soft in consistency; and (3) they are not encapsulated.

The brain is much more deformed by gliomata than by other types of tumors. When a tumor causing such deformity is removed, the sudden release of pressure results in marked oedema due to the filling up of the space by the compressed brain, and this oedema may throw out of function brain centers some distance from the tumor and cause death. Therefore before such a tumor is removed an attempt must be made to reduce the deformity by a decompression operation. This operation must be done on the side of the tumor for if performed on the opposite side the deformity would be increased.

To work in the intracranial cavity while the pressure is markedly increased is an unwise and almost impossible procedure. A preliminary decompression helps to reduce the pressure, but the dura should not be opened until the intracranial pressure has been brought down to, or slightly below normal. This reduction may be effected by withdrawing the fluid from the opposite ventricle by lumbar puncture and is evidenced by a reduction in the tenseness of the dura.

HOWARD A. MCKNIGHT.



**Cassamajor, L.: The Diagnosis of Brain Abscess.**  
*Laryngoscope*, 1920, xxx, 436.

The localization of brain lesions requires a co-operation on the part of the patient which usually is impossible to obtain when the lesion is an abscess. Other factors which render this neurological problem unique are the severity and usually short course of the condition.

Brain abscess resulting from purulent ear disease may develop in one of three ways: (1) by direct extension which often is of the nature of a localized meningitis; (2) by indirect extension, the abscesses frequently lying very deep and the route of infection being probably the Virchow-Robin lymph spaces in the vessel walls, the only lymph spaces in the central nervous system; and (3) by metastasis.

Ninety-three and nine-tenths of the abscesses of otitic origin are formed in the temporosphenoidal lobes and cerebellum.

The symptoms may be divided into three fairly definite stages:

1. The initial stage in which there is headache (which may be limited to the side of the lesion), vomiting, and clouding of consciousness.

2. The latent stage which persists from a few days to over a year.

3. The stage of general and local symptoms. Of the general symptoms fever may be subnormal or absent but if the abscess breaks through into the meninges or ventricles it is high. Headache may be more severe in a part remote from the lesion and cannot be relied on as a localizing symptom. Vomiting of the projectile type occurs in 75 per cent of the cerebellar cases and is ascribed by Okada to pressure on the medulla. Slowing of the pulse rate even in the presence of moderate fever is a frequent and important sign. Choked disc is found in only 53 per cent of all abscesses, optic neuritis without papilloedema being much more common because of the fact that the general symptoms of brain abscess are due much more to intoxication than to pressure. When the abscesses are large, convulsive phenomena simulating the epilepsy of eclampsia may occur.

Right temporosphenoidal abscess, which is the most common form, causes the least definite localizing signs. Left homonymous hemianopsia occurs when the optic radiation fibers are impaired, but the patient's mental condition usually prevents its discovery. In cases of left temporosphenoidal lesions a disturbance in the speech mechanism is the rule. Complete sensory aphasia or hearing disturbances are rare. Paraphasia is usual.

In cerebellar lesions the localizing symptoms are definite. The head is turned back or toward the side of the abscess and there is rigidity of the neck with increased pain in the head and dizziness when the patient sits up. As the muscular control of the cerebellum is homolateral, cerebellar signs are seen on the same side as the lesion. All movements of the limbs when the patient is reclining are asynergic, and adiakocinesis is usually present.

SPENCER S. HOWE.

**Fischel, E.: The Use of Radium in Carcinoma of the Face, Jaws, and Oral Cavity.** *J. Missouri State M. Ass.*, 1920, xvii, 267.

Following a discussion of the advantages of, and indications for, operation and the use of the high frequency current, Fischel states that nearly all basal-cell epitheliomata of the face may be cured by means of the roentgen ray. This treatment is of much less value, however, for other more malignant types of epitheliomata of the face, and is of practically no value when the lesion is located within the oral cavity. In discussing combined roentgen-ray and radium therapy, the author states that the alpha, beta, and gamma rays from each are quite similar, and rays of any desired strength and penetration may be obtained from either. Hence, theoretically, the similar results obtained by these therapeutic agents should be similar. While this is true as regards skin growths, it is not true as regards tumors in the deeper tissues and growths so large that they act as factors in both distance and screening. In such cases radium is more desirable as a definite amount may be buried in the tumor mass itself.

The character of the malignant growth is also an important factor. Most basal-cell epitheliomata may be cured by any method of treatment. This is true also as regards some squamous-cell carcinomata of low malignancy. The prickle-cell carcinomata are very resistant, however, and are prone to diffuse beyond the visible or palpable limits of the disease. This is the type most commonly encountered about the face, jaws, and oral cavity. As they are rapidly growing tumors and very highly malignant, they should be treated very radically from the beginning. If improper dosage is used stimulation rather than retardation may result.

The author outlines the method of treating cases of carcinomata at the Barnard Free Skin and Cancer Hospital. All cancer patients, other than gynecological patients, are presented at a conference of the entire staff, and if this staff decides that radium is to be used, a recommendation is made to that effect. The amount, screening, time, etc. are determined by the men who make the application. Most of the radium treatments are given with tubes. At first, small doses and heavy screening were employed, but better results were obtained when the use of large doses and less screening was instituted. With the latter method, fewer recurrences and less extension of the lesions have been noted.

Radium therapy is the treatment of choice for carcinomata of the face for several reasons. It least upsets the patient's routine life, the maximum dose may be applied over a definite area, and it is followed by a minimum of scar formation.

At present, cancer of the lower lip is treated with a heavy initial dose and very little screening. If no submaxillary glands are involved, the author waits three months and then removes the submental and submaxillary lymphatic systems, but if these glands are involved at the time the treatment is given they are removed within six weeks. If the submaxillary

glands are unquestionably involved, radical removal of all the superficial and deep glands up both sides of the neck is done one week later.

Lesions inside the oral cavity have not yielded so well to radium. Radium therapy is the treatment of choice for leukoplakias which are just passing into the malignant type of lesion. Warty growths within the mouth respond readily to radium rays. For technical reasons, however, the results have not been so good in the treatment of ulcerated carcinomata, but the author believes that this disadvantage may be overcome by the use of needles which may be fixed and buried at certain points.

Inoperable lesions may become distinctly operable following radium treatment. The use of both methods is clearly indicated in some conditions such as those in which the bones of the jaw or face are involved. The part of the bone involved by the growth should be removed and the radium buried in the wound to destroy any remaining cancer cells. This method is especially effective when there is involvement of the sinuses.

The author's conclusions are as follows:

1. Radium may be relied on to heal carcinomatous ulcers of the face.
2. Radium therapy is the most efficient method of treating carcinoma of the eyelids.
3. The use of radium has replaced the operative treatment of carcinoma of the lower lid in a large percentage of cases. Tributary glands should be removed by open operation.
4. The initial dose of radium should be the maximum dose deemed necessary for the complete destruction of the carcinoma.
5. The persistent use of radiation after it has been demonstrated that a growth fails to respond to it favorably is to be condemned.
6. Radium has limited use in carcinoma of the jaws and buccal cavity.
7. As an adjunct to surgery, radium is probably of very great value as its small bulk and diffuse and powerful action make it possible to implant it in small cavities which are inaccessible to any other method of approach.

W. L. BROWN.

**Ivy, R. H.: Maxillofacial Surgery of the War as Applied to Civil Practice.** *Dental Cosmos*, 1920, lxii, 825.

The author discusses the treatment of cases on his service at the Walter Reed Hospital, Washington, D. C., describing first the treatment of ununited fractures of the mandible due to loss of substance. Three methods which were used most frequently are:

1. Cole's method in which a pedicle taken from the mandible itself is employed.
2. Delezenier's osteoperiosteal graft method in which a thin shaving of bone with its periosteum is removed from the tibia and inserted in the breach.
3. The interposition of a thick graft cut from the tibia, the rib, or the crest of the ilium.

In all of these cases the fragments were properly reduced and fixed in position to insure normal

occlusion of the teeth, and the parts rendered free from sepsis. A case is cited in which the entire half of the mandible was lost because of necrosis due to dental infection. In this case the left lower jaw was kept in proper alignment for mastication by means of splints with interlocking flanges, while the right side was taken care of by an extension from the lower splint which restored the lost teeth and alveolar process. An osteoperiosteal graft from the tibia 10 cm. long and 2 cm. wide was embedded in the soft tissues of the right cheek at about the site of the lower jaw, and the depression in the face was filled with subcutaneous fat obtained from the abdominal wall. Radiograms made several months after operation showed considerable bone formation in the right mandibular region.

In cases of trismus from gunshot wounds gradual stretching was obtained by means of wooden wedges placed between the upper and lower teeth. In some cases it was necessary to divide the scar tissue in addition. A case is described in which splints connected with springs were adjusted and a jackscrew so arranged that the springs exerted a continuous pressure separating the jaws and it was possible to obtain a positive widening whenever necessary.

In his discussion of pedicle and sliding skin grafts Ivy describes the plastic repair of a gunshot defect of the chin and lower lip by means of a flap taken from the neck, and the new treatment developed by Waldron, Gillies, and their colleagues during the war to overcome limitation of motion of the lower jaw and lips due to adhesions to the alveolar processes. For the correction of depressions in the surface of the face caused by injury or disease the author prefers the use of fascia lata instead of abdominal fat.

A method of restoring the nose is described in which costal cartilage is implanted in the skin of the forehead, later transformed into a pedicled flap, and then sutured into the freshened edges of the nasal defect.

To restore the ears costal cartilage is cut to the proper shape and buried beneath the skin of the scalp immediately beside the defect. Two weeks later a scalp flap containing the cartilage is sutured to the remaining portion of the ear.

The article is concluded with a description of the treatment of burns of the face by a combination of surgery, massage, electrotherapy, X-ray treatment, and possibly the use of radium. LOUIS SCHULTZ.

**Chubb, G.: Bone-Grafting of the Fractured Mandible, with an Account of 60 Cases.** *Lancet*, 1920, cxcix, 0.

This article is an account of 60 consecutive and unselected cases of fracture of the mandible, all but 3 due to gunshot injuries, which were repaired by means of bone grafts. Non-union resulted in 4 cases because of sepsis, in 2 cases because of erysipelas, and in 1 case because of a discharging ear. Firm bony union was obtained in the remaining 56 cases in from one to four months.



The grafts were taken from the crest of the ilium in all but 2 of the cases. Such grafts have a natural curve quite like that of the mandible, great vascularity which hastens early vascularization and bony union, and softness.

The edges of the bone of the fractured mandible and those of the graft were trimmed so as to fit end-to-end with accurate apposition to the largest possible area of vital bone. In this position they were wired together. If there was close apposition of the ends at the time of operation, a certain amount of muscular stress, which hastened bony union rather than retarded it, could be allowed early without danger of disturbing the close bony contact. In 60 per cent of the cases so treated there was fairly firm union in from six to eight weeks, and very firm bony union in from three to four months.

The chief rôle of the dental splint was found to be the maintenance of correct occlusion during the operation. If the apposition of the ends of the bone and graft was exact and they were firmly wired at the time of the operation, it was found that the dental splint was unnecessary after two or three weeks. In 1 case the splint was removed in three days, with firm bony union later. If close apposition of the bone and graft ends was not possible at the time of operation delayed union occurred in some cases without the aid of the splint.

The pre-operative treatment consisted of the radical elimination of oral sepsis and the correction of deformity due to lingual pull, scar contraction, or faulty occlusion of the teeth. Early splinting prevented deformity. When scar tissue with contraction was present, it was divided and subsequently a dental splint was applied which reduced the deformity. If dental occlusion was faulty, extraction was done.

Some of the cases in the series have been under observation for more than a year. Successive roentgenograms have shown a progressive consolidation of the grafts which, under the influence of early muscular stress, become modified, conform to Wolff's law, and are encircled by a compact layer of bone.

The article contains a tabular analysis of the series of cases reviewed and numerous illustrations of various types of fracture of the mandible.

B. R. PARKER.

## NECK

**Marine, D., and Kimball, O. P.: The Prevention of Simple Goiter in Man. IV. *Arch. Int. Med.*, 1920, xv, 661.**

The authors' observations, covering a period of thirty months, show that simple goiter is easily preventable.

The treatment consists the administration of 2 gm. of sodium iodide given in 0.2 gm. doses daily for ten consecutive days and repeated each spring and autumn.

Of 2,190 students who took sodium iodide twice yearly, 5 had enlargement of the thyroid, while of

2,305 students who did not take the prophylactic, 495 showed enlargement of the gland. Of 1,182 students who had enlarged thyroids at the first examination, 773 showed a decrease in the size of the thyroid after treatment, while of 1,048 students who did not take the treatment only 145 showed a decrease in the size of the gland. These figures present in a striking manner both the preventive and the therapeutic effects of iodine medication.

The prevention of goiter in mother and foetus is as simple as the prevention of goiter during adolescence and is a responsibility of individual members of the medical profession. The prevention of the goiter of adolescence, on the other hand, should be a public health measure under government control. The most feasible method seems to be the administration of small amounts of iodine. Sodium iodide can be given in either solution or tablet form. For use in private practice the syrup of ferrous iodide and syrup of hydriodic acid are excellent. An ounce of these preparations given over a period of two weeks and repeated twice yearly seems to be sufficient. As a public health measure the authors advocate the administration of 2 gm. of sodium iodide over a period of two weeks, the dose to be repeated twice yearly. This treatment prevented the development of goiter in 99 per cent of the children in a region in which goiter was mildly prevalent. In individual cases the presence of pathologic conditions, however, may modify the result of the prophylactic treatment.

SAMUEL KAHN.

**Haggard, W. D.: Toxic Non-Exophthalmic Goiter. *South. M. J.*, 1920, xii, 506.**

By the term "toxic non-exophthalmic goiter" Haggard refers to the type of goiter described by Plummer as "toxic non-hyperplastic goiter" as contrasted with toxic hyperplastic or exophthalmic goiter. As a rule toxic non-exophthalmic goiters occur at about the twenty-second year of age while exophthalmic goiters are not observed until the thirty-second year. In the non-exophthalmic type of goiter the symptoms do not develop until a decade after the onset of the goiter itself, while in the exophthalmic type they are noted within a year.

Plummer differentiates two types of the non-exophthalmic group which merge into each other. The first is characterized by the predominance of cardiovascular symptoms and presents a picture similar to that seen in alcoholic or luetic cardiovascular disease. The second type simulates Graves' disease with the exception of the exophthalmos.

In cases of non-exophthalmic goiter the thyroid on pathologic section shows an increase in the parenchyma, often of the fetal type. The condition is probably the product of over-secretion grafted on a goiter already present.

The goiter is probably the result of a secondary infection which occurred in childhood, and the over-secretion is caused by toxic, metabolic, or psychic factors. The toxic factors are represented by

recurring infections, the metabolic stimuli are due to tissue activity incident to adolescence, menstruation, etc., and the psychic stimuli are the result of conscious or unconscious emotions.

The author decries the promiscuous use of iodides in the treatment of goiters, claiming that they are apt to set up toxic symptoms and a condition which is fatal.

If adenomata are not removed surgically they are apt to degenerate and cause toxic symptoms.

RALPH B. BETTMAN.

**Lahey, F. H.: The Diagnosis and Management of Intrathoracic Goiters.** *J. Am. M. Ass.*, 1920, lxxv, 163.

Concealed thyroid growths are of two types, namely:

1. Those which are completely intrathoracic, no part of the goiter being visible or palpable or just the uppermost part being barely palpable in the sternal notch. This group is made up of adenomata or cysts of the thyroid.

2. Those which are incompletely intrathoracic, the major portion of the goiter being on the neck and easily visible and its lower pole being substernal, subclavicular, or intrathoracic. This type is made up of adenomatous, cystic, or colloid goiters.

Intrathoracic goiter usually reveals itself by various degrees of respiratory obstruction dependent upon its progressive growth. Many cases of this type are treated for asthma.

A roentgen-ray examination demonstrates the substernal shadow to be continuous above as a distinct widening of the upper sternal shadow. A feature of even greater diagnostic value is the bowing or deviation of the trachea. This takes place when the adenoma or cyst grows from one side. When the growth is bilateral the trachea is not deviated, but is collapsed from before backward.

A late involvement of the recurrent laryngeal nerves, evidenced by the late development of huskiness of the voice when the tumor has been present for a long time, is a factor suggesting malignancy.

Intratracheal examination by a trained laryngologist is of great value in the diagnosis of these conditions as by this means, deviation, narrowing, or denting of the trachea from pressure may be demonstrated. Not only in the concealed, but also in the incompletely intrathoracic type has this measure been helpful in demonstrating pressure.

The most essential single feature in the operative procedure is the removal of the intrathoracic mass as a whole. Piecemeal delivery is to be avoided because of the almost uncontrollable deep bleeding which occurs if the tumor is broken up while still within the chest. The dissection must be effected by gently sweeping the fingers around the tumor within the lines of cleavage. The mass must not be dragged out from above, but should be pried out by pressure from below. In some cases it may be necessary to split the sternum.

HOWARD A. MCKNIGHT.

**Mason, J. T.: Mistakes in 100 Thyroidectomies; with a Description of a New Method of Thyroid Cauterization in Treating Exophthalmic Goiter.** *J. Am. M. Ass.*, 1920, lxxv, 160.

The author states that when goiters were first treated surgically poor judgment was shown by not operating on a few extremely ill patients because they had bad hearts. He now regards no patient with a toxic adenoma as too poor a risk to put at rest under observation with a view to thyroidectomy.

As recurrence of goiter and toxic symptoms seem to indicate that we have occasionally removed too little of the thyroid, the present tendency is to remove more rather than less.

With few exceptions, exophthalmic goiter runs a typical course. The typical case shows a slight thyroid enlargement with mild toxic symptoms for several months. These symptoms gradually increase until about the eighth month, when they become markedly worse. During the ninth month an explosion of symptoms, commonly known as a crisis, occurs. This is followed by a period of improvement with fairly constant symptoms. At about the end of the second year a second crisis develops which, however, is never quite so severe from the standpoint of toxicity as the first. After this there are ups and downs until after a period of years the toxicity of the goiter wears out and occasionally a cure results although as a rule the patient is in a very poor condition, suffering from cardiac and general degeneration.

Unfortunately good surgical risks have been permitted to become extremely poor ones because temporary improvement generally results if the patient is put completely at rest.

The ideal time for operation is within the first six months. The patient operated on before the first crisis is eventually much better off than the patient who is carried to, and then through, the crisis by medical treatment and is not operated upon until later.

Lack of judgment as to the best time for interference and the best type of operation on exophthalmic goiter has given much grief; the most serious mistakes have been due to the lack of a full appreciation of the dangers of the crisis of the disease and an attempt to do too much in extremely bad cases.

In extremely serious cases ligation of the superior thyroid artery or injection of boiling water does not give the results to be desired and the reactions are sometimes severe. Actual cauterization of the gland approaches perfect surgical cure. It is simple and painless and can be performed without the patient's being conscious of what is going on. The reaction is negligible, and the results have been excellent.

Local anæsthesia is begun by pressure applied for thirty seconds to the point chosen for the first needle puncture by means of a cotton applicator frozen solid with ethyl chloride. Careful infiltration with procaine is then done and an incision 2 cm. long is made just to the inner side of the sternomastoid muscle, in the line where the thyroidectomy in-



cision will be. The gland is exposed by deepening the incision and splitting the muscles. The goiter is exposed, the fibrous capsule separated from the anterior surface of the gland, and the field dried. While cold, an electric cautery is then passed through the incision down to the anterior surface of the gland. When the current is turned on the cautery is slowly rocked from side to side, a portion of the gland about the size of a shoe button being destroyed and coagulation of a much larger area being effected.

This procedure may be repeated every few days, larger portions of the gland being destroyed until the patient is considered a safe risk for ligation or thyroidectomy. The usual collar incision will manifestly obliterate all external evidence of the cauterization.

HOWARD A. MCKNIGHT.

**Bartlett, W.: An Emergency Technique for Thyroidectomy.** *J. Am. M. Ass.*, 1920, LXXV, 169.

Up to the present time the admirable Halsted technique based on anatomical grounds, or some modification of it, has been employed whenever a thyroidectomy has seemed indicated. It has fulfilled all requirements with an assured margin of safety when the patient has been carefully chosen, but the indications for thyroidectomy may be very considerably broadened by the employment of a technique which is based on pathologic principles and makes the minimum demand on the patient's strength. To this end every consideration of a cosmetic nature must be waived, the sole aim being to destroy the greatest amount of thyroid tissue possible. If done in the usual manner this could not be accomplished without risk to life.

The emergency technique contemplates the most direct, rapid, and bloodless approach to the tumor, prevents contamination of the tissues by toxic thyroid fluids, saves the time ordinarily spent in ligating vessels and closing the wound, and eliminates the accidents which not infrequently cause loss of blood during the ligation of the numerous vessels divided.

In the past the great danger of thyroidectomy for toxic patients has been due to the fact that the surgeon attempted too much and thus brought about a fatal postoperative toxic condition. In general, patients have been divided into three classes: (1) the safe risks, (2) those who were rejected, and (3) the doubtful class in which most of the unpleasant postoperative surprises occurred. The author's emergency technique is intended for the doubtful class of patients whose condition seems too good for ligation, but to whom no positive guarantee of safety can be given after a classical thyroidectomy has been done.

The preparation for the operation does not vary materially from that generally used. The patient is rested and fed, and morphine and fluids are given to ward off the impending acidosis. She is then taken to the operating room in full possession of her faculties and without further morphine.

The head of the table is slightly elevated, and the site of the intended incision marked just behind the anterior border of the sternomastoid, care being taken not to run down within 1 cm. of the clavicle. A diamond-shaped area is infiltrated about the growth. Infiltration of the subcutaneous fat and muscle planes with 0.5 per cent procaine is sufficient.

The form of incision used has a number of advantages. It allows approach to the tumor by the most direct route, it encounters fewer vessels than the collar incision, it avoids extensive separation of tissue planes, it is in line with the axes of the important deep structures, and it obviates retraction to a very considerable extent. The resulting ridge-like scar lies on a preformed prominent ridge, i.e., the sternomastoid muscle.

The platysma incision corresponds to that in the skin; the ribbon muscles are split longitudinally over the most prominent portion of the growth below.

The exposed lobe is caught with clamps and lifted. At this point the whole defect is flooded with alcohol to seal up all tissue spaces against the absorption of toxic material to be liberated in the amputation.

The upper pole is then divided and the lobe gently drawn toward the angle of the jaw, while the capsule and goiter substance are divided after clamping from above downward. In order to reduce tissue necrosis to the minimum none of the thyroid substance within the grasp of clamps is ligated. To prevent the retention of toxic products no attempt is made to whip over the cut thyroid substance. The instruments are bunched together with a mass of dressing wrapped about them in such a way as to bring pressure to bear on the skin of the neck and their handles. Thus they are lifted upward instead of being allowed to rest on the floor of the defect.

It goes without saying that a wound held open in this manner cannot possibly retain the fluids forming in it; hence the most complete drainage is secured.

The after-treatment consists in giving  $\frac{1}{2}$  gr. of morphine when the patient leaves the table to prevent severe after-pain. It is customary to repeat this dose as often as the respiration goes over 20; otherwise restlessness may wear out a damaged heart.

The original dressing is not touched until the postoperative storm, if there be one, is over. After twenty-four hours the clamps are unlocked, except those on the main thyroid vessels, and are allowed to fall off in the next few hours by their own weight.

The operation is over as soon as the lobe is amputated, a fortunate circumstance as the resistance of a toxic patient under local anæsthesia is about gone when this stage of the thyroidectomy has been reached. The operation has been greatly shortened, perfect drainage has been secured, and there is none of the hæmorrhage that occasionally complicates the tying off of so many clamps. HOWARD A. MCKNIGHT.

## SURGERY OF THE CHEST

## CHEST WALL AND BREAST

**Wessler, H.:** *The Diagnosis of Encapsulated Pleural Effusions.* *Med. Clin. N. Am.*, 1920, iv, 69.

In an inflammatory process in the pleura adhesions will be most apt to form in the regions in which the movement of the lung and chest wall are restricted. Transudates are rarely sacculated; exudates frequently. Another element which may determine the localization of a pleural effusion is the presence of an inflammatory focus at the surface of the lung, the slow extension of which to the pleura may result in an encapsulated effusion.

Encapsulated effusions may be divided into four types as follows: (1) effusions encapsulated in the general pleural cavity (parietal effusions); (2) effusions encapsulated between the lung and the diaphragm; (3) effusions encapsulated between the lung and the mediastinum; and (4) interlobar effusions.

The most common type of effusion is situated in the axillary portion of the chest. In cases of atypical effusions it is advisable to aspirate in the axilla. The signs of pleural effusion often closely resemble those of consolidation, particularly in children.

In distinguishing an upper lobe effusion from pneumonia, the development of an area of dullness or flatness in the axilla, especially when it increases from day to day, is important. The roentgen plate is also of diagnostic value.

In encapsulated empyemata at the base the diagnosis is most difficult when a thick shaggy exudate along the margin of the effusion gives rise to râles.

A primary encapsulated effusion in the mesial portion of the chest near the mediastinum is perhaps the rarest form.

Multilocular effusions which may or may not communicate with each other must be watched for. They do not necessarily develop simultaneously and therefore the character of their contents may vary.

A superficial lung abscess may be the cause of a purulent or a non-purulent pleurisy in its immediate vicinity.

Of all effusions in the chest the interlobar effusion offers the greatest difficulty in the diagnosis. These are very rare. The three general causes are:

1. Metapneumonic conditions. These are often serous and ultimately absorb, so that they remain latent throughout their course.

2. Pulmonary tuberculosis. Pulmonary tuberculosis is a frequent cause, especially in children.

3. Idiopathic conditions. Such causes have no discoverable association with pulmonary disease and the effusion is the result of a primary infection of the pleura.

When the interlobar effusion increases to a measurable extent it will probably burst its adhesions and

infect the general pleural cavity. The physical signs of interlobar effusions are indefinite.

In a large percentage of cases of acute inflammatory pleural effusion the ribs are drawn together because of the reflex contraction of the intercostal muscles in inflammatory conditions of the underlying viscera.

A marked separation of the ribs is usually found only in large non-inflammatory effusions and occasionally in cases of empyema in children when the effusion has been a very rapid process.

Twenty-four case reports are given with 31 X-ray pictures illustrating the various types of effusions.

CARL R. STEINKE.

**Ashhurst, A. P. C.:** *Observations on Empyema.* *Ann. Surg.*, 1920, lxxii, 12.

At the meeting of the American Surgical Association twenty-six years ago the author's father, in opening the discussion on empyema, laid down the following six propositions:

1. "No operation is justifiable: (1) unless the presence of pus is certain; (2) unless thorough treatment by medicinal agents, blisters, etc., has failed; or (3) unless the symptoms, dyspnoea, etc., are so urgent as to demand immediate relief.

2. "The first operation should consist of simple aspiration with antiseptic precautions.

3. "When the fluid has partially re-accumulated, as it almost certainly will do if purulent, incision and drainage should be practised.

4. "Drainage is best effected by making two openings, one at the lowest available point, and carrying a large drainage tube through the cavity from one opening to the other.

5. "Drainage should be supplemented by washing out the cavity with mild antiseptic fluids. When the lung has expanded and the discharge has nearly ceased the tube should be shortened, the upper opening being allowed to heal and the tube being then gradually withdrawn through the lower opening.

6. "When the lung is so bound down by adhesions that it cannot expand, resection of one or more ribs should be practised (Estlander's operation, so-called), in order to allow collapse of the chest wall."

The object of this article is to review the progress made in the treatment of empyema in the generation which has elapsed since the former discussion referred to. The mortality following operation at that time averaged from 20 to 30 per cent, and such it has remained in the hands of the average surgeon.

Even at present the average surgeon is unwilling to operate unless pus has been found by aspiration. The author maintains, however, that though numerous punctures are negative, it is not only justifiable but imperative at the present day to resort to exploratory thoracotomy when the symptoms are



urgent and the surgeon is as certain that pus is present as he can be without finding it by puncture. The technique of exploratory thoracotomy in these cases was described by the author in 1916 as follows:

Under local anæsthesia and with the patient prone, from 8 to 10 cm. of the eighth or ninth rib are resected just in front of its angle. On opening the pleura the upper thoracic cavity is isolated by gauze packs, and the lung, if adherent to the diaphragm, is dissected free. An encapsulated empyema often is found here. If this area is free, the packs are rearranged, the lung is separated from the costal pleura, and the interlobar fissures are explored. If necessary, another rib is resected. When the pus collection is found it is evacuated and drained across the pleural cavity in the same way as an intraperitoneal abscess.

The author has operated in this manner on six cases in which numerous punctures failed to locate the pus and the patients were dying of sepsis. Three patients died: one because the encysted empyema was not found (the autopsy showed that the interlobar dissection had reached to within 2.5 cm. of the abscess); one because moribund at the time of operation, the empyema having ruptured into a bronchus; and one as a result of sepsis arising in the parietal wound, some weeks after he had passed from the author's care. In a seventh case exploration was negative and the patient died subsequently from the pre-existent pneumonia.

In massive as in encapsulated empyema Ashhurst operates under local anæsthesia with the patient lying prone and resects 3 or 4 cm. of the ninth, tenth, or eleventh (rarely the twelfth) rib. He lays great stress on ample and dependent drainage, believing that the doctrine of through-and-through drainage advocated by his father merely followed as a corollary in cases in which the primary opening was made too high; in other words, that the primary opening should be made at the site of election mentioned, regardless of where the needle has found pus. He opens the chest higher only if an encapsulated empyema is located very high (under the third or fourth rib, for example) as, even if the healthy pleural cavity is opened low down, he believes it is easy to break through an encapsulated empyema at its lowest point; and thus secure dependent drainage.

Irrigations the author regards as unnecessary in the ordinary case. Instillations of Dakin's fluid, he states, may certainly cause disintegration of fibrinous deposits lining the empyema cavity and in very old empyemata may prove advantageous. So far, however, not one of his cases has remained unhealed, and dependent drainage is all that has been provided. From a study of his own operations, 43 in number, he draws the following conclusions:

1. Cases of pleural effusion suspected to be purulent should be aspirated, and if the effusion is massive, most of it should be removed by aspiration one or two days before a thoracotomy is undertaken.

2. If the fluid found on puncture is serous or seropurulent, thoracotomy usually may be postponed until frank pus has formed as this delay will permit the formation of firmer adhesions and thus prevent complete collapse of the lung when the empyema is opened. Cures of such seropurulent effusions, however, have occurred so rarely without final resort to thoracotomy that attempts to cure the condition by the injection of antiseptics into the unopened pleura are usually detrimental to the patient.

3. If in a case of suspected empyema the symptoms are urgent but pus cannot be found by puncture, exploratory thoracotomy should be undertaken in an effort to locate and drain the pus.

4. The operation of thoracotomy for empyema should be done under local anæsthesia and should provide free and dependent drainage secured by the resection of a rib (usually the ninth, tenth, or eleventh) in front of its angle.

5. Postoperative irrigations are unnecessary unless, after several months, the lung shows no tendency to expand, when the use of Dakin's fluid may prove beneficial. When the cavity is small, injections of bismuth paste may effect closure.

6. If the cavity cannot be made to heal by these means, major thoracotomy combined with decortication of the lung and discission of the pleura should be done. In some cases resection of a number of ribs to permit the chest wall to collapse in part and meet the expanding lung may be necessary.

Among the author's first nine patients there were five deaths (three those of infants less than a year old). Since adopting the principle of wide and dependent drainage under local anæsthesia, Ashhurst has operated on thirty-four patients. Four died—one, because the encapsulated empyema was not found; the second, from gangrenous stomatitis (noma); and the third and fourth from sepsis arising in the thoracic wound and apparently brought on by irrigations some weeks after the patient had passed from the author's care.

The average time for closure of the thoracic wound in the cases of patients who have been traced was just over nine weeks, and in those who remained under the writer's care, just over seven weeks. Final closure was secured in all cases traced (thirty-one of the thirty-three patients who recovered) without an Estlander or similar operation.

#### Lilienthal, H.: Empyema: A Syllabus of Operative Treatment. *Ann. Surg.*, 1920, lxxi, 87.

In this paper the author has attempted to construct a table for the standardization of operative methods in all the usual forms of empyema of the thorax. Tuberculosis, syphilis, and actinomycosis, etc., are not included.

He believes that when empyema cavities are simple and single they may be treated by ordinary drainage with subsequent disinfection, but that the more complicated cases require full exploration with the simplification of the contour of the cavity and mobilization of the lung.

The treatment of lung abscess, simple or bronchiectatic, when complicating empyema, is merely suggested.

Chronic empyema with sinus demands non-collapsing thoracoplasty.

A sinus with bronchial fistula in the depths will often close when the cavity is sterilized as well as possible and filled with Beck's paste or iodoformized vaseline.

Attention is called to the importance of the X-ray and fluoroscope.

In the author's opinion empyema is a disease which demands treatment in a hospital.

**Moszkowicz, L.: Physical Factors in the Treatment of Empyema** (Physikalische Erwaegungen zur Empyembehandlung). *Med. Klin.*, 1920, xvi, 201.

The Buehlau "lift" drainage method is easy to use, decreases the danger of pneumothorax and shock, and causes excellent expansion of the lung. The evacuation of the lung, however, is incomplete and drainage disturbances are difficult to avoid. Rib resection guarantees complete evacuation of pus, but is associated with severe shock, pneumothorax, and collapse of the lung.

Under local anæsthesia the author resects 2 ccm. of the sixth rib in the posterior axillary line and through a very small pleural opening introduces two drains which he packs off well. The ends of the drains are placed in vessels containing sterile salicylate solution. The shock is minimal with this method and the lift drainage is immediately effective. When one of the glasses containing warm normal salt solution is lifted above the thoracic opening a comfortable irrigation of the pleural cavity takes place.

In the 21 cases treated by the author by this method there were 4 deaths and these were due to other complications. For the after-treatment the breathing exercises of Hofbauer are recommended.

PAUL DEUS (Z).

**Bunts, F. E.: Operation for Empyema in Young Adults.** *Ann. Surg.*, 1920, lxxii, 66.

This paper is based on the author's experience with 175 cases of empyema in a base hospital.

Whenever possible, the X-ray was used to detect the presence and location of the empyema as it was found to be a more accurate diagnostic method than the use of the aspirating needle.

When bacteria were present aspiration was done under primary ether anæsthesia, after which a 2 per cent solution of glycerine and formaline was injected. Seven out of 16 of these cases did not require further operation. When both yellow pus and bacteria were present an operation was performed within twenty-four hours unless there were signs of pneumonia. Ether anæsthesia was used except in a very few of the most serious cases, and without any ill effects. In addition, a local anæsthetic was employed over the area of rib

to be resected. The bone was excised rapidly and a long  $\frac{3}{4}$  in. tube was inserted, sutured tightly to the wound, and clamped, the clamp being opened at half-hour intervals until the chest was evacuated. The patient was kept in the Fowler position. After about ten days the cavity was washed out twice daily with various solutions. Blowing into a bottle was insisted upon after the unaffected side had been strapped with adhesive, and as soon as possible the patient was moved out-of-doors, given breathing exercises, and allowed as much food as he would take.

Postmortem examinations revealed the fact that all of the deaths were due to pyæmia rather than empyema.

That this method of operating for empyema is worthy of consideration is proven by the excellent permanent results it obtained and its low mortality rate; a secondary but important advantage is the elimination of the usual disagreeable odors which are usually associated with empyema.

**Tichey, H.: The Influence of the X-ray after Operation for Carcinoma of the Breast** (Der Einfluss der Roentgennachstrahlungen auf die Heilerfolge der Operation des Brustkrebses). *Zentralbl. f. Chir.*, 1920, xlvii, 470.

The following table compiled according to Perthes' classification gives the cases of carcinoma of the breast observed at the surgical clinic of the University of Marburg:

Cases	Recurrences in first year		Metastases of recurrences without local recurrence		
	No.	Percent	No.	Percent	
Group 1: No X-ray treatment . . . . .	62	7	11.2	3	3.8
Group 2: Inadequate X-ray treatment . .	36	15	41.7	6	16.6
Group 3: Repeated X-ray treatment . .	23	8	32	1	....
Group 4: Intensive X-ray treatment . .	11	5	45.5	2	18

As in Perthes' report, the highest number of recurrences during the first year occurred among the patients who had received the most intensive treatment. The number of cases is too small to warrant an estimation of the occurrence of metastases outside of the region operated upon, but it seems probable that such metastases were most numerous also in the cases belonging to Group 4. The results therefore agree in the main with those of Perthes.

BOTT (Z).

## TRACHEA AND LUNGS

**Jackson, C., and Spencer, W. H.: The Diagnosis and Localization of Non-Opaque Bodies in the Bronchi.** *Am. J. Roentgenol.*, 1920, n. s. vii, 277.

The authors have had an opportunity to observe and record the physical signs in hundreds of cases of foreign bodies in the lower air passages and to compare these with the findings made by the roentgenographer, checking both by the actual location of the



foreign body observed at bronchoscopic removal. This routine examination has enabled them to locate non-opaque bronchial foreign bodies from the physical signs with considerable accuracy. The history of the case, a peculiar asthmatoïd wheeze, paroxysmal cough, dyspnoea, and fever constitute the chief diagnostic indications of the presence of such foreign bodies. The physical examination of the chest usually reveals lessened expansion on the affected side and a peculiar impaired resonance to percussion which the authors call "muffled tympany." When secretions have accumulated distal to the obstruction or an abscess has formed, marked dullness is present. The breath sounds are greatly diminished and later are usually absent. The unobstructed side is somewhat fuller and harsh breathing is heard over it, which in some cases is associated with very loud snoring, snapping, and bubbling bronchial râles.

The roentgen findings reported by Manges are in accord with the pathology and physical findings and offer valuable information as to the presence and location of a foreign body, even though it may not be visualized, and as to the nature of the pathological condition present. These findings are summarized as follows:

1. In the early stages of the reaction to a foreign body in the bronchus there is often over-distention of the lung on the side of the obstruction, the enlargement of the bronchial lumen during inspiration allowing the passage of a small amount of air, the escape of which during expiration is prevented by the diminution of the bronchial lumen. Thus a moderate distention of the affected side results—an acute obstructive emphysema.

2. The three characteristic roentgenographic signs of this condition are: (1) increased transparency of the affected side; (2) depression of the diaphragm on the affected side; and (3) displacement of the heart and mediastinal structures away from the affected side.

3. The unusual clearness of the obstructed side and the comparative clouding of the free side have led many observers to localize a non-opaque foreign body erroneously.

4. With the development of drowned lung or lung abscess distinct shadows of the pathological condition allow the definite localization of the non-opaque foreign body. To wait for this development, however, may be dangerous, if not fatal.

5. The possibility of a shifting of the foreign body must always be kept in mind.

6. The roentgenologist should know the salient points of the history and interpret his findings as regards non-opaque bronchial foreign bodies only after consultation with the physician who examined the chest. In this way much confusion may be avoided and many new facts may be learned.

A number of detailed case reports with roentgenograms taken before and after the removal of the foreign body are included in the article.

ADOLPH HARTUNG

## HEART AND VASCULAR SYSTEM

**Mocquot, P., and Costantini, H.: Wounds of the Heart with Delayed Symptoms, A Special Clinical Type of Heart Wound; Secondary Hæmopericardium** (Plaies du cœur à symptômes retardés; une forme clinique spéciale des plaies du cœur; l'hémopéricarde secondaire). *Rev. de chir.*, Par., 1920, lviii, 257.

Until recently a heart wound without threatening hæmorrhage either externally or into the pleura was not considered possible. It is now known, however, that a number of heart wounds produce only a slight immediate hæmorrhage, the diagnosis being made only later, sometimes not until after recovery from the injury. An immediate fatal hæmorrhage does not necessarily follow a serious heart wound. There are so-called "dry" wounds of the heart.

The authors report a case of their own and cite ten from the literature in which a wound of the heart was followed by an interval free from symptoms and then by alarming collapse due, as a rule, to hæmopericardium.

In all of these cases of late hæmopericardium the authors believe the region injured is the ventricular region. An auricular wound is always penetrating because of the thinness of the auricular wall. Therefore bleeding occurs at once. In a narrow jagged wound of the thick ventricular wall, however, a clot may form and effect a temporary or permanent hæmostasis. Thus a dry wound may heal spontaneously. When such a clot becomes detached, sudden hæmoperitoneum is produced like that in the cases described.

In almost all of the cases reported the clots were noted in the pericardium. Apparently the blood does not behave in the same way here as in the pleura and it is reasonable to infer that the pleural serosa possesses qualities which the pericardium lacks.

The authors discuss the various diagnostic symptoms of hæmopericardium. Among these the radioscopic demonstration of immobility of the cardiac and pericardiac shadow is of very great importance. Immediate surgical intervention to empty the pericardium and obtain hæmostasis is indicated. For such an operation the authors believe that a median thoraco-abdominal incision such as that described by Duval and Barnsby offers the best approach to the heart. In the authors' case suturing of the wound in the heart with catgut was effected easily and hæmorrhage was insignificant.

WILLIAM A. BRENNAN.

**Tuffier: Surgery of the Heart** (La chirurgie du cœur). *Presse méd.*, Par., 1920, xxviii, 517.

A wound of the heart with external hæmorrhage, hæmopericardium, or hæmothorax demands immediate operation. When such wounds are untreated the mortality is considerably higher than when treatment is given. Statistics show also that strict asepsis is necessary in the operation as the

great majority of the postoperative complications are due to operative infection.

Foreign bodies should be extirpated during the primary operation if they can be reached easily, or secondarily, or late, according to the complications which arise. There are three routes of approach to the heart.

1. By the formation of a thoracic flap, the convexity of which extends beyond the midline of the sternum. The fourth, fifth, and sixth costal cartilages are turned back temporarily and the pericardium is exposed. If necessary, a small sternal flap is also turned back on the right side. This route has the disadvantage that it opens the pleura.

2. By means of a simple intercostal incision at the level of the fourth space. The thorax and pleura are opened and the approach to the heart obtained by retraction with or without resection.

3. By means of a median vertical incision sectioning the sternum and a transverse incision opening the abdomen. Forced separation then gives a wide approach to the heart without opening the pleura. When the pericardium is incised care must be taken not to injure the phrenic nerves.

A wound of the heart may be sutured with the heart *in situ* or after it is brought to the surface of the thorax. Only moderate traction should be used and this should be released if the heart beat stops.

The incision of the heart for the removal of a foreign body or the treatment of an endocardial lesion must not be made in any of the danger zones. Such zones are those near the bundle of His, the interauricular septum, and the large coronary vessels, including the coronary artery from its origin to its bifurcation. Section here is fatal but the branches of the coronary artery may be tied off with impunity. To extract a foreign body the heart should be taken in the palm of the hand and the region to be incised should be limited by two fingers. The possible complications of this procedure are cardiac syncope and hæmorrhage.

Of the three methods of cardiomyotomy, the cardiocostal is indicated most frequently and gives the best results. This has been used in cases of bilateral pericardial pleural adhesions with concomitant and consecutive asystole.

It has been proved experimentally that absence of the pericardium is compatible with life.

Surgery has been used in only a few cases of valvular lesions, but is indicated both experimentally and clinically in cases of aortic stricture.

Tuffier has massaged the heart to restore the contractions of the muscle in 68 cases. He was successful in 15 cases. These were cases of chloroform poisoning and cardiac syncope due to asphyxia. The pressure should be made upon the ventricles and should be soft, regular, and prolonged. The subdiaphragmatic route of approach has given the best results. Success depends especially on the duration of the syncope, the nature of the operation, and the cause of the accident. Re-animation is more apt to be obtained if the massaging is done during

the first ten minutes of syncope. Massive injections of saline or adrenalin solutions into the arteries have been found of value in addition to the massage.

WILLIAM A. BRENNAN.

## PHARYNX AND ŒSOPHAGUS

**Guisez, J.: The Treatment of Severe Cicatricial Strictures of the Œsophagus** (État actuel du traitement des sténoses cicatricielles graves de l'œsophage). *Presse méd.*, Par., 1920, xxviii, 421.

In this article Guisez discusses only those cases of cicatricial stenosis which are due to trauma, disregarding cases of inflammatory stenosis which become cicatricial in the advanced stages. Since 1903 he has treated 135 such cases. Most of them were caused by the swallowing of caustic fluids. Only 6 were due to foreign bodies. More than two-thirds of these traumatic stenoses, although impassable by a soft catheter, were easily overcome by a few endoscopic treatments. Forty-four were particularly severe, the patient being unable to swallow liquids or even saliva. In 36 of these severe cases, however, a single œsophagoscopy treatment was successful. In the others, direct endoscopy or gastrotomy following retrograde catheterization was employed.

Direct endoscopy is of particular value to discover the minute passage which represents the lumen of the œsophagus and is generally situated excentrically in a fold of the mucosa. Even when the passage is the size of a pinhead fluid alimentation is still possible. When the lumen is found, a filiform bougie should be inserted. The treatment may be aided by painting the area with a solution of cocaine to which a few drops of adrenalin have been added. The filiform bougie should be well supported and allowed to remain in place for ten or twelve hours. Any attempt to replace it immediately with a larger bougie will usually result in failure. The substitution of a larger bougie should be delayed until the filiform bougie passes freely. Successively larger bougies should then be introduced. In order to prevent a false passage these bougies should be screwed to the end of the exploring filiform bougie.

When there are several stenoses, and especially when they are not concentric, each must be dilated separately, the uppermost first.

In 4 cases of difficult stenosis in which gastrotomy was necessary the author used the von Hacker method of continuous dilatation from below upward. While this method is efficacious in cases of stenosis in the region of the cardia, it is very painful and its results are less apt to be permanent than those obtained by circular electrolysis.

In the author's opinion the cardia cannot be reached any more successfully by even a very extensive gastrotomy than by retrograde œsophagoscopy. In many cases there is complete closure and adhesion of the walls of the œsophagus at the cardia by an impassable cicatricial block. Catheterization upward under retrograde œsophagoscopy



or following gastrotomy is useless; the filiform bougie always passes more easily from above downward under direct endoscopy, and if this fails, no better results will be obtained by retrograde endoscopy.

WILLIAM A. BRENNAN.

**Judd, E. S.: Oesophageal Diverticula.** *Arch. Surg.*, 1920, i, 38.

The author states that diverticulum of the oesophagus is not an uncommon condition, although only about 200 operative cases have been reported; this number includes the cases reported from the Mayo Clinic.

The two common types of diverticula are the so-called pressure and traction diverticula. Traction diverticula are usually multiple and often symptomless until they are converted into the traction-pressure type. This conversion takes place

in about 7 per cent of the cases. The author has observed 2 cases.

The X-ray and the oesophagoscope have made possible the elimination of many errors in diagnosis by enabling the clinician to differentiate such conditions as diverticulum, stricture, obstructing cancer, and cardiospasm.

In some cases of oesophageal diverticula dilatation is the only treatment necessary but in the majority of instances surgery is definitely indicated. The two-stage operation rather than the one-stage intervention is recommended because of its simplicity and infinitely greater degree of safety as neither the oesophagus nor the sac is opened and the surrounding tissues and spaces are not exposed to infection until firm granulations have formed. The ultimate functional results have been very satisfactory.

## SURGERY OF THE ABDOMEN

### ABDOMINAL WALL AND PERITONEUM

**Downes, W. A.: The Management of Direct Inguinal Hernia.** *Arch. Surg.*, 1920, i, 53.

All surgeons agree that in the indirect or oblique hernia the results of surgical treatment are excellent, provided the operation is performed properly and according to one of the approved methods. No such claim can be made for the operative results in cases of direct hernia, nor can it be said that there is a standardized operation for this condition.

The difficulty lies in selecting the cases suitable for operative treatment. As a rule, the patients in whom recurrence is almost sure to take place belong to a definite group. Usually such patients are thin and have poorly developed muscles in both lower abdominal quadrants. To this group may be added certain others who have accumulated considerable fat over the lower abdomen.

The patient with a direct inguinal hernia should be carefully studied before operation is recommended. If the condition of the lower abdominal muscles is such that a fair chance of obtaining a cure cannot be offered, the question of operation should be deferred for the time being and the patient advised to take systematic exercises for six months or a year.

Direct hernia occurs most often in men between the ages of 25 and 45, but is occasionally seen in younger persons and even in children. It is rare in women. Poorly developed or deficient musculature in the lower half of the abdominal wall may be said to be the underlying cause in practically every instance. In many of these patients the pelvis is narrow and Poupart's ligament and the fibers of the external oblique muscle take an almost vertical course.

In the diagnosis the following points must be considered: (1) the patient's age and sex; (2) the

condition of the lower abdominal muscles; (3) the side on which the hernia occurs (direct hernia is often bilateral); (4) the situation of the hernia (the direct hernia occurs low down over the pubic bone except in very early cases in which the sac has not descended to the external ring); (5) the character of the globular swelling (in direct hernia it does not tend to enter the scrotum even if large and is easily reducible); and (6) the condition of the lower portion of the inguinal canal.

In the selection of the operative technique as much care is necessary as in the selection of cases for operation. While the great majority of these herniae fall into two general groups—the usual form, in which the protrusion occurs through the normal weak portion of the transversalis fascia, and the combined direct and indirect type—an operation which will prove satisfactory in one case may be wholly inadequate in another.

The author makes the usual skin incision, carrying the lower angle down to the pubic bone, splits and retracts the aponeurosis, exposes Poupart's ligament, and makes traction on the cord to be sure that no indirect hernia is present. Next, he exposes the sac, strips the fat gently from its surface, ligates it flush with the transversalis fascia, and removes the excess. He then opens the sheath of the rectus, sutures the muscle to Poupart's ligament with kangaroo tendon, and does the classical Bassini or Andrew's operation.

HOWARD A. MCKNIGHT.

**Russell, R. H.: Infantile Hernia, Enormous Hernia, and Gibbon's Hydrocele.** *Med. J. Australia*, 1920, i, 505.

The author disagrees with Lockwood's view that in infantile hernia the processus vaginalis is obliterated high up in the region of the internal ring but open all the rest of the way down to the tunica

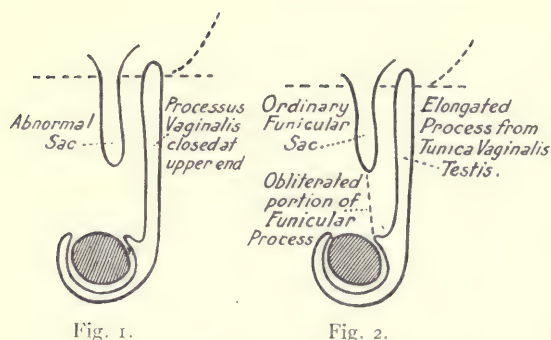


Fig. 1.

Fig. 2.

Fig. 1. Lockwood's view. Fig. 2. Russell's view.

vaginalis testis, and that the hernial sac is an abnormal sac which comes down behind the processus vaginalis. In Russell's opinion the long process of peritoneum in front which terminates in a blind end above is due to the catching up of the tunica vaginalis testis by the abdominal wall prior to, or during, the descent of the testis. As a consequence of this the tunica vaginalis testis is drawn out into a long process by the descent of the testis. The sac Russell regards as a perfectly normal funicular sac unaffected by the presence of the long process of peritoneum described.

In the author's three cases of infantile hernia he cut down onto an apparently ordinary inguinal hernia. The first incision through the integuments of the groin opened up a serous cavity which extended down to the bottom of the scrotum and in which lay the naked testis. On cutting through the farther wall of this cavity he found the ordinary hernial sac and cord. The operation was completed in the usual manner.

Inguinal herniæ in which a portion of the processus vaginalis is implicated accidentally, as in these infantile herniæ, are: (1) properitoneal, (2) interstitial, and (3) superficial inguinal herniæ, depending on the position of the sac. Incomplete descent of the testis is a characteristic complication of such herniæ, all of which result from implication of the funicular portion of the processus vaginalis rather than of the testicular portion (tunica vaginalis testis).

The greatly enlarged and elongated tunica vaginalis testis with complete patency of the funicular process must be the essential anatomical cause of the "enormous herniæ" or herniæ complicated with hydrocele.

MARCUS H. HOBART.

#### GASTRO-INTESTINAL TRACT

**Stierlin, E.: The Innervation of the Stomach and Its Relation to the Etiology and Treatment of Ulcer** (Ueber die Mageninnervation in ihrer Beziehung zur Aetiologie und Therapie des Ulcus). *Deutsche Ztschr. f. Chir.*, 1920, clii, 358.

After a brief discussion of the motility and innervation of the stomach Stierlin discusses the newer theories regarding the pathogenesis of ulcer,

especially those of von Bergmann and Hart, according to which gastric ulcer is of nervous origin. Aschoff ascribes the condition to mechanical causes, and Virchow, Payr, Schmincke, Benecke, and Hart, to vascular changes. Animal experiments have corroborated all of these views, especially those of von Bergmann (Gundelfinger).

Von Bergmann constantly found defects of the stomach and duodenum after extirpation of the sympathetic nerve, which he regarded as due to local ischæmia and spasm resulting from hyper-tonicity of the vagus. The author repeated these experiments and tested the motility with the X-ray but did not observe spasm even at the pylorus, or any actual ulcers. In further studies which were made of the stomach from which the afferent nerves had been removed he found a very active and cramp-like gastric peristalsis. The cause of this condition can lie only in the autonomic system of the plexus myentericus. In the circular muscle layer supplied by this system only tetanic contractions can occur. The author therefore believes that there is some relationship between this spastic contraction and the formation of ulcer induced probably by products of metabolism or internal secretion carried to the stomach by the circulation. The vagus and sympathetic nerves may also take part in it.

On the basis of this hypothesis the author discusses the value of operative measures in cases of gastric ulcer, especially gastro-enterostomy and resection. The former is beneficial because it permits rapid evacuation, lowers the acidity, and by section of the nerves, causes changes in the gastric motility. The best action is obtained if the opening is made transversely in the caudal portion of the stomach.

Much more favorable results are obtained by transverse resection of the stomach as the physiological function is less disturbed. The principal benefits of this operation are a decrease in the acidity (Faulhaber and von Redwitz) and rapidity of evacuation. The primary mortality is somewhat higher but the later mortality is lower than that of gastro-enterostomy (Kloiber).

In conclusion the author suggests a new operative procedure which is less dangerous but retains the advantage of the transverse resection. It consists in an extramucous incision around the stomach which eliminates the influence of the vagus nerve and therefore the pyloric spasm associated with ulcer. The evacuation of the stomach is hastened and the acidity is decreased. KLEINSCHMIDT (Z).

**Mayo, W. J.: The Calloused Ulcer of the Posterior Wall of the Stomach.** *Ann. Surg.*, 1920, lxxii, 109.

From July 1, 1914, to July 1, 1919, 647 operations were performed in the Mayo Clinic on 638 patients with gastric ulcers, the average mortality being 3.2 per cent. During this same five-year period 2,734 operations were performed on 2,720 patients with duodenal ulcers, with an operative mortality of 1.2 per cent. In 28 of the 638 cases of gastric ulcer the ulcers were multiple. Five hundred and thirty-four



gastric ulcers were located on or around the lesser curvature, 85 involved the posterior wall, 9 were on or around the greater curvature, 5 were on the anterior wall, and 5 were not located definitely. Eight and two-tenths per cent of the ulcers on the posterior wall were in the pyloric third; 75.3 per cent in the middle third; and 16.5 per cent in the cardiac third. All the ulcers were of the chronic perforating varieties. The ulcer encroached on the pancreas in 53 cases, and in a few of these, on the liver, transverse colon, or mat of adhesions.

Of the 85 patients with ulcer on the posterior wall 57 were males and 28 were females. The average age was 43.9 years; the oldest was 69 and the youngest 18. The average duration of symptoms was six years and six months. The average weight loss was 17.8 lb. Anæmia was present in all cases and was marked in 14; the maximum hæmoglobin was 66 and the minimum 26. The pain was slight in the epigastrium in 56 per cent of the cases, in the back in 24 per cent, radiating to the right in 15 per cent, to the left in 8 per cent, and downward in 8 per cent. Food gave relief in 50 cases. There was slight to moderate obstruction in 35 per cent. Nineteen patients had gross hæmorrhages, 21 vomited blood, and 15, whether or not they vomited blood, had blood in the stools. The clinical diagnosis was correct in 71 cases. The X-ray diagnosis also was correct in 71.

The author states that it is difficult to determine the frequency with which chronic ulcer undergoes malignant degeneration as clinical diagnosis is notoriously defective, postmortem evidence cannot prove the original disease, and operations which do not permit the actual excision of the lesion or the removal of a specimen for microscopic examination cannot be relied on. Aschoff points out that if the lesion is cancer originally the base of the ulcer will prove to be cancer, while Wilson and MacCarty have shown that in cases of cancer on ulcer the cancer existed in the overhanging margins of the ulcer and not in the base.

Balfour has shown that in cases of duodenal ulcer treated by gastro-enterostomy in which there had been hæmorrhage before operation 1 in 8 had hæmorrhage afterward, while in cases of gastric ulcer hæmorrhage occurred in only 1 in 12. Balfour explains this by the frequent excision of gastric ulcer because of its liability to cancer and the infrequent excision of duodenal ulcers. The death rate from duodenal ulcer in the first two years after operation is practically the normal death rate and for the second two years is less than normal, while for gastric ulcer the average death rate in the four years after operation is three times normal; a percentage of the patients undoubtedly die from cancer of the stomach.

Methods of operative treatment are evaluated as follows:

A. Cautery or knife excision is of value in cases of small ulcers.

B. Gastro-enterostomy alone is at times warranted by the patient's local or general condition.

C. Resection by the Billroth or Polya-Balfour methods is suitable for pyloric ulcers, while resection in continuity has been found an excellent method for ulcers in the middle third.

D. Excision and gastro-enterostomy are the logical procedures in the average case but are sometimes followed by adhesions that immobilize the posterior wall of the stomach. After the posterior wall of the stomach is exposed through the gastro-hepatic omentum the ulcer is detached from the pancreas and a specimen removed for microscopic examination. The ulcer is then excised with the cautery and the gap in the stomach closed; the suture line is covered with the end of the great omentum which is drawn through an opening made in the gastrocolic omentum into the lesser cavity of the peritoneum and attached in such a manner as to cover the field of operation. A posterior gastro-enterostomy completes the operation.

**Woolsey, G.: The Results of Operation in Gastric and Duodenal Ulcers.** *N. York M. J.*, 1920, cxi, 84.

The author reports in detail the results of various operations performed in 109 cases of gastric and duodenal ulcer during a period of about six years ending December, 1919. Cases of acute perforating ulcers are not included.

Follow-up records were obtained in as many cases as possible. The results are considered excellent when no gastric symptoms were reported; as satisfactory, when there were only occasional vague symptoms which were not those of ulcer; and as unsatisfactory when the patient complained of considerable abdominal discomfort, even though it seemed probable that the symptoms were due to adhesions or other extragastric causes rather than to ulcer.

There have been 7 postoperative deaths, 5 since January, 1916.

The cases reviewed included 58 cases of duodenal ulcer. Reports which were received from 48 patients showed that the results of operation were excellent in 90.9 per cent. The best results were obtained by the Wilm's method of pyloric exclusion which was performed in 20 cases. The excellent or satisfactory results in this group amounted to 94.7 per cent. In the 26 cases in which exclusion was not done 88 per cent of the operations were successful. While exclusion with fascia is intended to be only temporary, in 1 case it was found on fluoroscopic examination fifteen months after the operation.

Appendectomy in addition to gastro-enterostomy did not influence the final result in any case.

Constipation was relieved in the majority of cases but was aggravated in a few. When this condition was absent the results of operation were better than when it was present.

Eructation of gas was noted three times as often before operation as after, and in all but 1 case in which it followed operation it had been present previously.

In 1 case there were symptoms of ulcer twenty-one months after the operation. During a gastrotomy two years after the first operation 6 in. of thread were found hanging from the inside of the anastomosis. All of the symptoms disappeared when the thread was removed. The Mayos have showed that such non-absorbable sutures are probably the most common cause of gastrojejunal ulcer. For the past four years, therefore, the author has used No. 0 chromic gut.

In 1 case a duodenal ulcer which was not demonstrated in the X-ray plate was shown in the fluoroscope when the stomach was pressed aside.

Eighteen cases of gastric ulcer were treated by gastro-enterostomy alone, and in this group there were no postoperative deaths. The Murphy button was used successfully in 2 cases. Reports received from 14 patients showed that 78.5 per cent of the operations were successful. Gastro-enterostomy alone cured 1 case of hydrochloric acid burn and 3 cases of chronic ulcer. The best results following gastro-enterostomy for gastric ulcer were obtained in cases of chronic pyloric stenosis with dilatation of the stomach.

The author is convinced that excision alone is unsatisfactory. Better results are obtained when excision is combined with gastro-enterostomy or, better, with the Balfour cautery operation. Mesogastric resection does not give as good final results as excision.

There were 26 cases of gastric ulcer treated by resection of the stomach by the Billroth method. The mortality was 15.3 per cent. In gastric ulcers near or at the pyloric end of the stomach the author does a resection, preferably by the Polya-Reichel technique. If the antrum is normal and the ulcer is 3 or more inches proximal to the pylorus he does a mesogastric resection. When the ulcer is so far from the pylorus that this operation becomes difficult, an excision or the Balfour cautery method with a gastro-enterostomy is preferable. In the cases reviewed the results were satisfactory in only 60 per cent of those treated by resection. In 4 cases in which the Billroth method was used and in 9 treated by the Polya-Reichel method the results were excellent. Carcinoma developed in a case of non-resected ulcer five and one-half years after the operation, during which time there had been entire absence of symptoms.

Dietetic treatment should be given following operation. The care of the teeth and gums is also important. Operation does not cure the ulcer but merely puts the stomach in such a condition mechanically and chemically that healing of the ulcer is favored.

MARCUS H. HOBART.

**Downes, W. A.: Congenital Hypertrophic Pyloric Stenosis: Review of 175 Cases in Which the Fredet-Rammstedt Operation Was Performed.** *J. Am. M. Ass.*, 1920, lxxv, 228.

Fredet suggested making a longitudinal incision in the serous and muscular coats of the pylorus and

converting the longitudinal incision into a transverse incision by suturing. Rammstedt suggested leaving the pyloric wound gaping. The Fredet-Rammstedt operation combines these two techniques.

In 175 cases treated by a Fredet-Rammstedt operation there were 30 deaths (17.1 per cent). In the cases coming to operation four weeks or less from the date of the onset of the symptoms the mortality was 8 per cent. All deaths occurring in the hospital after operation were recorded as operative deaths. Eighteen babies died in collapse in from three to seventy-two hours. None was re-used operation. The average age was 9 weeks. The postmortem examination was negative in every instance. Five patients died of general peritonitis, 2 of acute gastro-enteritis, and 3 of hæmorrhage.

The diagnosis was based on the history and physical findings. The principal symptoms were forcible vomiting, loss of weight, and visible peristalsis in the epigastrium passing from left to right. A tumor mass at the pylorus was considered conclusive evidence of hypertrophic stenosis.

Downes discusses the medical treatment of the condition, the operative technique, and the complications.

Of the 145 babies discharged as cured, 89 have been seen or traced in the last two months. All are in excellent health. Eleven have died and 45 have been lost sight of.

The author's conclusions are as follows:

1. If a satisfactory history can be obtained, and if the findings of proper physical examinations are correctly interpreted, a diagnosis of congenital hypertrophic pyloric stenosis is possible in practically every case.

2. If the patient is observed from the onset of symptoms, medical treatment may be tried for a period not longer than ten days, provided the weight loss does not exceed 20 per cent during this time. If at the end of this period the child does not show definite improvement, operative interference is indicated. Any patient who suffers a relapse while under medical treatment should be operated on at once.

3. When data as to the previous weight are lacking and the patient's condition is not very good an operation should be performed at once if the condition has persisted for ten days.

4. The mortality among patients coming to operation within four weeks from the onset of symptoms is less than 8 per cent.

5. The results following the Fredet-Rammstedt operation are permanent and the cure complete.

CARL R. STEINKE.

**Gillon, G. G.: A New Pylorus.** *Practitioner*, 1920, civ, 423.

This article presents a new and simple method of dealing with pyloric obstruction, a modification of the routine method of no-loop posterior gastro-enterostomy which has been done for years. There



has been much dissatisfaction with the results obtained by the no-loop posterior gastro-enterostomy as many patients complain of uncomfortable sensations and vomiting, and are in poor health. The normal mechanism of the duodenum has been disturbed and the duodenal contents mix with the food too soon.

The author has overcome these difficulties by first performing a long loop gastro-enterostomy and then anastomosing the proximal and the distal loops of jejunum 3 or 4 in. below the gastro-enterostomy.

The distal loop of jejunum between the gastro-enterostomy and the jejunostomy functionates as the first portion of the duodenum, while the double jejunum at the anastomosis acts as the second portion of the duodenum. Accordingly the duodenal contents do not mix with the food until they reach the double portion of jejunum, and jejunal ulcers do not occur.

The author's experience over a period of nine years has been that patients operated upon in this way gain in weight very rapidly, never have hyperacidity, and never suffer from the uncomfortable symptoms which so commonly follow the no-loop gastro-enterostomy.

H. K. BEGG.

**DeMartel, T.: Gastrectomy; New Operative Technique** (Gastrectomie; nouvelle technique opératoire). *Presse méd.*, 1920, xxviii, 433.

The author outlines a new method of approach and technique in performing a gastrectomy for malignancy or extensive ulceration.

During the pre-operative period the mouth and teeth are thoroughly cleaned and a daily stomach lavage is given not only to cleanse the stomach, but also to accustom the patient to these measures in case of postoperative necessity.

If ether is used as the anæsthetic, morphine and scopolamine are administered to quiet the respiration and decrease secretions. Patients operated on under spinal anæsthesia are given a small amount of ether in addition. Spinal anæsthesia does not produce so much shock as general anæsthesia, and causes excellent relaxation of the abdominal wall. Paravertebral anæsthesia is difficult to carry out and often unsatisfactory. Local infiltration, which may be satisfactory in a gastro-enterostomy, is insufficient for a gastrectomy.

The patient is placed on the operating table with the head and upper part of the trunk in a horizontal position and the hips and lower extremities at an angle of 45 degrees. A median incision is made from the sternum to the umbilicus. If a gastrectomy is to be done, the lower pole of the incision is continued at a right angle, thus making a triangular opening. This gives an excellent exposure of the pylorus and is also very satisfactory for operations on the gall-bladder and bile ducts.

More than the usual amount of time is required to make the incision and close the opening, but this is compensated for by the facility with which the

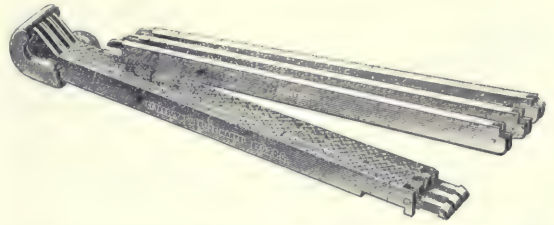


Fig. 1. The author's crushing forceps in position for applying.



Fig. 2. The forceps and lock in place and ready for closure.

operation may be performed. The omentum is stripped from the colon and incised at the area in which the resection is to be done and the large vessels on the greater and lesser curvature of the stomach are ligated and cut. The opening on the lesser curvature of the stomach created by the ligation and cutting of the vessels is enlarged to accommodate the author's *ecraseur*, or crushing forceps. This forceps is composed of six blades with a detachable clip on each end to aid in applying it and maintaining the alignment. After its application the two central crushing blades are removed and the stomach is sectioned between the others. Sufficient tissue is left on the proximal side to permit suturing of the opening. The pyloric end is then raised and a section made through the duodenum. This is done either by clamping and infolding, or by tying *en masse* and infolding after crushing.

The majority of accidents following gastrectomy are due to poor closure of the duodenum. Peritoneal surfaces should be approximated accurately. The duodenum should be completely covered on its posterior side and, with the denuded surface of

the pancreas, should be protected with a portion of the omentum.

The operation is completed by an anterior gastro-enterostomy parallel to the resected border of the stomach.

A. J. SCHOLL, JR.

**Bland-Sutton, J.: Clinical Lecture on Fibroids, Lipomata, Dermoids, and Polypi of the Stomach and Intestine.** *Lancet*, 1920, cxcix, 5.

Fibromyomata may develop in any portion of the gastro-intestinal tract and may occur as subserous or submucous growths. They are comparatively rare and may lead to intussusception or vulvulus. Histologically they may closely resemble sarcoma.

Lipomata occur either in the subserous or submucous portion of the stomach and intestine. When formed in the subserous position they cause a dimpling of the serosa.

Dermoids are the most rare of all tumors occurring in the intestinal tract and are found in the terminal segment of the large bowel.

Polypi (adenomata and papillomata) single or multiple, may develop from the mucous membrane of any portion of the gastro-intestinal tract. They may be flattened or wart-like and simulate colic cancer. The symptoms are recurrent attacks of pain, diarrhoea, and melenæ. Anæmia and loss of weight result. The diagnosis is established by the sigmoidoscope. Polypi are uncommon in the stomach.

J. A. H. MAGOUN.

**Terry, W. I.: Ulcer of the Jejunum following Gastrojejunostomy.** *J. Am. M. Ass.*, 1920, lxxv, 219.

The principal factors in the production of jejunal ulcer following gastro-enterostomy are the introduction into the jejunum of non-neutralized acid gastric juice and the lowering of the resistance of the jejunum or the anastomotic opening to the digestive action of the gastric juice by trauma. The further down the jejunum the anastomosis with the stomach is made, the greater the probability of the development of a jejunal ulcer. This explains the greater number of ulcers after the anterior operation in which the longer loop is employed.

Three case reports are given somewhat in detail. The conclusions drawn are as follows:

1. The exact etiology still remains in doubt; in all probability the principal factor is the diversion of acid chyme into a part of the intestine which has less neutralizing power than the duodenum. Other factors of prime importance are trauma, especially from retained sutures or anastomosis buttons, and infection.

2. As the number of cases of ulcer of the duodenum following pyloroplasty or gastroduodenostomy is very small, it would seem wise to employ those operations in suitable cases.

3. Gastro-enterostomy should be performed with much care; clamps, if used, should be adjusted without causing trauma of the viscera, and only absorbable sutures should be employed.

4. Patients subjected to gastro-enterostomy should be instructed as to a suitable diet and this diet should be continued for at least a year. In addition, antacids should be given if the gastric analyses seem to warrant their employment.

5. Patients should be urged to seek advice again if pain returns.

CARL R. STEINKE.

**Josselin de Jong: Subserous Adenomyomatosis of the Small Bowel** (Zur Frage der subserösen Adenomyomatosis des Dünndarms). *Frankfurt. Ztschr. f. Path.*, 1920, iii, 400.

The author, who was the first to describe subserous adenomyomatosis in the literature, discusses the criticisms of his report made by Hueter and Busse. He again describes his pathologico-anatomic findings and states that the chronic hyperplastic inflammation resulting in thickening of the serosa and contraction of the lumen is due to stimulation of the surrounding connective tissue by a new growth. This new growth consists of small nodules containing glandular tubules lined with cylindrical epithelium which are embedded in cytogenous tissue and surrounded by a layer of muscle cells. The gland formations are not contiguous with the mucosa of the bowel and differ from the normal glands of the mucosa.

Hueter does not believe in the theory of new formation. He considers the glands of inflammatory origin and suggests that the condition should be called "peritonitis adenoides." The author endeavors to refute this theory on the basis of his experimental findings. The theory of Busse that the condition is due to metastatic tumor formations he declares is contrary to the microscopic findings.

JANSSEN (Z).

**Bevan, A. D.: Surgery of Cancer of the Large Intestine.** *J. Am. M. Ass.*, 1920, lxxv, 283.

In cases of cancer of the large intestine in which there is obstruction a preliminary colostomy is of great value. This is usually done through a muscle-splitting incision at the appendix area. With a non-cutting needle a single suture is passed through all the layers of the abdomen, transfixing the mesentery of the bowel close to the bowel itself, and out the opposite side of the incision, the two ends being fastened to a bone or porcelain button about 1 in. in diameter. The skin incision is then closed with a black silk suture without suturing the peritoneum or muscle, and the entire field is covered with thick, sterile zinc oxide paste. A No. 12 or 14 American catheter is introduced into the proximal loop and held by two purse-string sutures of Pagenstecher linen. The colostomy opening is completed after three days by electrical cauterization.

The surgery of cancer of the large intestine is based on three basic principles:

1. Different incisions must be made for carcinoma in different locations: a right split-muscle incision for cancer of the cæcum and ascending colon; a large S-shaped incision on the right side when the growth



involves the region of the hepatic flexure; a large S-shaped incision on the left side when the growth is found in the region of the splenic flexure; a split-muscle incision on the left side for cancer of the descending colon or sigmoid; and a midline incision above the umbilicus for tumors near the center of the transverse colon.

2. The section of bowel involved by the growth and operative procedure must be mobilized very fully.

3. In surgery of the large bowel side-to-side anastomosis with closure of both bowel ends by crushing, ligating, and invaginating with Pagenstecher linen is indicated. The mortality of such an anastomosis is only one-half that of end-to-end anastomosis.

Cases without obstruction require only one operation, but when the symptoms of obstruction are noted the three-stage operation is best, i. e., colostomy, removal of the growth, and closure of the colostomy. The three-stage operation is preferable to the Mikulicz operation.

In cases of carcinoma of the rectosigmoid the growth should be removed through the abdomen and a left inguinal colostomy made. When feasible, the rectum should be invaginated. If advisable because of the extent of the involvement the entire rectum should be removed.

In the excision of carcinoma of the lower 4 in. of the rectum as much of the rectum should be left as possible after splitting the rectum and removing the coccyx. If the rectum is extensively involved, the Kraske operation with complete removal of the rectum and the formation of a sacral anus is necessary. On the whole, the tube resection should be discarded.

Two case reports are given. CARL R. STEINKE.

**D'Agostini, F.: The Diagnosis of Perforation of Meckel's Diverticulum and Observations Concerning Diverticulitis in General** (Contributo alla diagnosi della perforazioni del diverticolo di Meckel e delle diverticolite in genere). *Riforma med.*, 1920, xxxvi, 565.

The author does not discuss Meckel's diverticulum as a complication of intestinal obstruction, but considers the differential diagnosis between perforation of this structure and perforation of the appendix. The symptoms of the two lesions are similar and the differentiation is often difficult.

The literature shows that a diagnosis of perforation of Meckel's diverticulum is made very rarely. The author believes, however, that such a diagnosis is possible if the anatomical differences in the appendix and diverticulum are borne in mind. The appendix is richer in lymphatics and follicles than any other part of the large intestine. Meckel's diverticulum, though similar in structure to the tunics of the intestine, is more reduced and rudimentary in its strata and poorer in vessels because of its vestigial nature. Inflammation in either the appendix or the diverticulum originates in the

mucosa, but in the case of the appendix the lymphatic system is more rapidly involved. Perforation of the appendix is preceded by a true general and diffuse lymphangitis which is centrifugal from the walls of the meso-appendix and adjacent peritoneum. Such a lymphangitis always precedes the appendicular lesion and is characterized by more or less intense local pain in the right iliac fossa.

Because of the poorer supply of lymph vessels in the diverticulum symptoms preceding diverticular perforation pass unobserved and perforation results in a sudden diffuse peritonitis without any history of abdominal disturbances. The seat of pain is also different from that in perforation of the appendix.

Differentiation between the two conditions is most important as a lesion of the diverticulum demands immediate operation whereas in cases of appendicular lesions expectant treatment may be given.

WILLIAM A. BRENNAN.

**Stone, H. B.: Some Plastic Operations on the Rectum.** *Surg., Gynec., & Obst.*, 1920, xxx, 608.

This article reports four operative methods.

1. A method of clearing defective Whitehead operations by mobilizing the skin about the anus and shifting it upward.

2. An operation for annular strictures based on the principles of the Heinecke-Mikulicz operation.

3. An operation for tubular strictures in which a flap of vaginal mucous membrane is shifted to the rectum to enlarge the amount of stricture.

4. An operation for recto-urethral fistula consisting of the establishment of suprapubic drainage followed by the mobilization of the whole lower rectum as in an exaggerated Whitehead operation. This permits exposure and closure of the urethral opening. The portion of the bowel containing the fistula is then amputated and a closure made of the perineum and mucocutaneous margin.

**Crile, G. W.: Cancer of the Rectum.** *J. Am. M. Ass.*, 1920, lxxv, 286.

From a study of the literature and his own series of cases of cancer of the rectum Crile found that the principal cause of death in this condition is infection and the absorption of toxins from the fæces. Therefore the first surgical step should be the complete diversion of the fæcal stream by a preliminary colostomy. As a rule this should be performed under analgesia and local anæsthesia. The incision for the colostomy (preferably the Littlewood incision) should be made large enough for exploration. A sharp angulation of the colostomy may be obtained by inserting a short flanged glass tube under the loop of the colon and over the surface of the skin. A wide excision of the growth should be made after a week or longer. At first, infection of the field may be controlled by packing with well wrung-out iodoform gauze, but as soon as the suture line is secure the Carrel-Dakin method is indicated. The wound must be kept clean at all times.

If there is danger of peritonitis, or if peritonitis is present already, the opium-water-posture-heat method should be inaugurated at once. This method is all but specific.

If secondary anæmia is present or healing is retarded, blood transfusion is indicated and the patient should be given the benefit of a dietetic and hygienic regimen identical with that prescribed in cases of tuberculosis.

The colostomy should be closed only after the intestine has completely healed.

In 72 cases the mortality was 9.7 per cent. Crile's own series of 38 operations included 20 radical operations with no mortality. The end-results will be reported later. This article contains one table and seven illustrations.

CARL R. STEINKE.

### LIVER, GALL-BLADDER, PANCREAS, AND SPLEEN

**Einhorn, M.: The Diagnosis and Treatment of Gall-Bladder Affections.** *N. York M. J.*, 1920, cxii, 1.

The diagnostic methods used by the author in cases of obscure gall-bladder affections are as follows:

1. X-ray examination. By this means conditions casting shadows in the region of the gall-bladder can be detected. It can be determined also whether the duodenum has been distorted by the gall-bladder lesion and whether the gall-bladder, pylorus, and duodenum have been pulled to the right by adhesions.

2. Direct examination of the bile obtained from the duodenum when the patient is fasting. In pathologic conditions the bile is turbid and dark and contains mucus and pus. Frequently also bacteria, cocci, and accumulations of cholesterol and calcium crystals are found in it. Pus and mucus indicate the presence of cholecystitis. Pus and mucus plus cholesterol and calcium crystals indicate cholecystitis and stone. In complete obstruction of the common duct no bile will be found.

3. Duodenal bucket and string test. This test differentiates between peptic ulcer and gall-bladder affections. Clear bile in the bucket with blood stain on the string indicates ulcer, while a turbid bile and a negative string test indicate gall-bladder pathology.

These examinations plus the clinical symptoms and the objective findings should make the diagnosis more conclusive.

The treatment of all gall-bladder affections may be divided into that of acute and chronic conditions.

Acute cholecystitis with or without stones should be treated by absolute rest, hot applications, opiates, colonic flushings with warm saline, and drinks of warm water or tea. Recurrent attacks should be warded off by reducing stagnation of the bile and combating the infection.

Chronic cholecystitis is treated in the same manner except when there are several severe recurrent at-

tacks and when mild attacks are accompanied by a leucocytosis, the condition is due to obstruction, and malignancy is suspected. In such cases operation is necessary.

HAROLD K. BEGG.

**Hall, M. W.: A Study of the Blood after Splenectomy: with Special Reference to the Leucocytes.** *Am. J. M. Sc.*, 1920, clx, 72.

Hall reports the case of a cavalryman at Fort Houston, Texas, who, while caring for his horse after the usual drill, was seized with faintness, nausea, and sudden sharp pains in the left upper quadrant of the abdomen. A laparotomy was performed six hours later. Hæmorrhage in the peritoneum was traced to a small tear in the spleen.

In most previous reports on the blood picture after splenectomy emphasis has been laid on the changes in the red cells and hæmoglobin, although far more striking changes, both quantitative and qualitative, have been recorded for the leucocytes. In the author's case anæmia was of such slight degree, if present at all, that attention was concentrated on the white cells almost exclusively.

The changes in the white blood cells are shown in this article by a series of charts. The observations may be divided into three periods, the first covering the time from the seventh to the sixteenth day after operation; the second, an intermediate period; and the third, a period extending from October 15 to November 5, when the study ended. Uniform results are recorded for the first and last periods. The averages for the intermediate period were valueless because of marked variations.

In the final period comparative equilibrium with a moderate increase in the total count due entirely to lymphocytes and endothelial cells was reached and the granular leucocytes showed strictly normal figures. The endothelial cells were constantly increased both relatively and absolutely. A striking feature in the study was the fact that at no time was an eosinophilia present.

A. R. HOLLENDER.

### MISCELLANEOUS

**Decker, R., Jr.: Technical Progress in the X-Ray Examination of the Abdominal Organs by Means of Pneumoperitoneum** (Technische Fortschritte der Roentgenuntersuchung der Bauchorgane mittels Pneumoperitoneum). *Muenchen. med. Wchnschr.*, 1920, lxvii, 664.

The author usually inserts the Denek needle in the midline between the umbilicus and the symphysis pubis. The needle, which is dull and closed in front, has a side opening. The inflowing air, about 2 liters, is drawn out of two glass flasks half filled with a mercuric chloride solution and connected by a pipe. After the X-ray examination has been made with the patient in various positions, the air is allowed to come out through the needle. Deep inspiratory movements and external pressure aid in the deflation. The examination may be made also while the patient walks about.



Inflation of the large intestine or of the stomach by effervescing powder is sometimes necessary in addition to the pneumoperitoneum. Inflation is contra-indicated by meteorism and suppuration. The method is especially valuable for detecting intra-abdominal tumors, postoperative inflammatory carcinomatous pockets, and peritoneal tuberculosis in children. In cases of tuberculosis the air is allowed to remain in the abdomen for therapeutic reasons.

Diseased and changed gall-bladders, unless shrivelled up, are almost always evident, but the gall-bladder contents are not visible unless calcium stones are present. The early diagnosis of cancer of the stomach is aided by the inflation method.

Diagnoses of spleen, liver, and kidney conditions are reported. Pneumoperitoneum will not replace the former X-ray examination, but will supplement it.

GRASHEV (Z).

**Stein, A., and Stewart, W. H.: Pneumoperitoneal Roentgen-Ray Diagnosis.** *J. Am. M. Ass.*, 1920, lxxv, 7.

In 1919 Stein and Stewart adopted pneumoperitoneal roentgenography in order to diagnose abdominal lesions more accurately. Since that time they have so improved the technique that they are now able to show the parenchymatous organs, their mutual relations, and their pathologic changes distinctly. The procedure has been utilized in 80 cases with no untoward effects. The ages of the patients varied from 4 to 74 years. The practicability of the method in the cases of children is shown by a recent diagnostic inflation of the abdomen of a 9-year-old boy. In this case, the presence of a mass on the right side, in the region of the diaphragm, was suspected but was disproved by the inflation.

The only apparatus necessary for pneumoperitoneal roentgen-ray diagnosis is a lumbar puncture needle, a rubber tube, and an oxygen tank. The lumbar puncture needle and the rubber tube having been thoroughly sterilized and the tube connected with the oxygen tank, the apparatus is ready for use.

The patient is prepared as for an roentgen-ray examination by a thorough cleansing of the bowels and emptying of the bladder just before the inflation is begun, and  $\frac{1}{2}$  gr. of morphine is given half an hour previously.

The needle is usually inserted in the median line about one to two finger breadths below the umbilicus. The skin in this area is thoroughly cleaned with tincture of iodine. The use of a local anæsthetic is unnecessary. Merely taking a fold of the skin tightly between the fingers is sufficient to counteract any pain incident to the introduction of the needle.

The needle is slowly inserted as far as the fascia. Then, by very gentle pressure, it is eased through the fascia and peritoneum into the abdominal cavity. The free end of the rubber tube having been connected with the needle, the oxygen is

allowed to flow gently into the abdominal cavity. The amount of gas varies from 2 to 4 liters according to the requirements of the particular case.

The air or gas used in the application of this method is not sterilized.

In the authors' experience the method has had no unfavorable effects. The elasticity of the intestine permits it to recede before a sharp intruding body such as a needle.

About one-third of the patients have complained of marked pain in the shoulders following distention of the abdomen to its full capacity. No heart symptoms except a slight rise in pulse were noted.

Recently the authors have employed the deflation method to relieve the patient of real or imaginary pain in connection with the procedure. After the patient has been brought back to bed the lumbar puncture needle is reinserted in the same manner as before, so that the air may escape through it. Before the adoption of the deflation method it was found that occasionally the pain did not begin until late in the evening. In this event the foot of the patient's bed was elevated in order to confine the oxygen to the lower pelvis and reduce the pressure against the diaphragm.

Pneumoperitoneum demonstrates all the parenchymatous organs which heretofore have not been rendered sufficiently plain in the roentgenogram. The authors have been able to show the liver and, in many instances, pathologic enlargements and deformities of the gall-bladder. In several cases gall-stones, different varieties of splenic enlargement, and cysts of the liver, pancreas, and ovaries were demonstrated, while in others the female genital organs in their entirety and tumors of these organs were shown.

Probably one of the most distinct reproductions is the renal outline. When used in conjunction with pyelography, pneumoperitoneum accurately outlines the renal pelvis and calices and at the same time shows in detail the renal structure, its enlargements, and deformities.

Changes of the vertebral column are also much more clearly revealed by this method.

The contra-indications to the use of pneumoperitoneum are acute appendicitis and peritonitis. Patients who have used alcohol to excess do not tolerate the method well.

The procedure should not be employed indiscriminately but should be reserved for suitable cases. In trained hands and when used with a proper technique, it yields the most gratifying results.

GEORGE W. HOCHREIN.

**Reed, C. A. L.: Some Typical Recoveries in Iowa from Chronic Convulsive Toxæmia (Epilepsy) following the Surgical Correction of the Abdominal Viscera.** *J. Iowa State M. Soc.*, 1920, x, 204.

Constipation with its associated anatomical disturbances may produce the typical attacks seen in epilepsy. These cases usually bear out the following facts: (1) there is a constant relationship

between the convulsive phenomena and faecal retardation; (2) the faecal retardation depends upon anatomical disturbances, generally ptosis of some part of the gastro-intestinal tract; and (3) it is frequently possible to cure both the constipation and the convulsions by the surgical correction of the anatomical conditions underlying and causing the constipation.

In the series of cases reviewed either grand mal, petit mal, or both were present and associated with constipation. The diagnosis was greatly aided by the use of the barium meal and the X-ray which confirmed the location of the anatomical disturbance. The anatomical disturbances found were: caloptosis, redundant sigmoid, descensus of the liver, gastrocaloptosis, Lane's kink, cæcal dislocation, and adhesions at various locations.

The operative treatment consisted of the breaking up of various adhesive bands, hepatopexy when the liver was involved, and straightening of the cæcum if it had become rotated following an operation for appendicitis. When a Lane's kink was discovered the lower portion of the ileum was freed. In cases which are not suitable for immediate operation an appendectomy may be performed, more radical intervention being delayed.

Of 26 surgical recoveries, 8 have been actual cures and 11 probable cures. Many of the patients have not been heard from since the primary operation.

ROBERT R. MUSTELL.

**Hohlbaum, J.: Congenital Defects in the Mesentery Causing Intestinal Obstruction** (Ueber die angeborenen Mesenterialluecken als Ursache von Darmeinklemmung). *Beitr. z. klin. Chir.*, 1920, cxix, 468.

The author reports three cases of ileus caused by a defect in the mesentery. In these cases the defects were found in the mesentery of the lowest portion of the ileum near the ileocæcal juncture. This is the most typical location. A satisfactory explanation for the formation of such defects has not yet been discovered. Trauma, which is placed foremost among the possible causes in the older literature, is rare and therefore cannot be a very important factor. On the other hand, the fact that the mesentery near the ileocæcal juncture is frequently found lacking in fat and blood vessels and is often thin and free, and the fact that other anomalies in formation are found indicates that the condition may be congenital. Prutz believes that the cause is inflammation but as a rule no inflammatory changes about the edges of the defective mesentery and in the surrounding tissues can be discovered.

In the first case reported by the author adhesions had been formed in the vicinity of the defect and a calcified mesenteric lymph gland was found lodged within the opening underneath. While in this instance it could be readily assumed that the defect in the mesentery was of inflammatory origin, especially as the patient gave a history of mesenteric lymph-gland tuberculosis, the fact that such defects

do not occur after peritonitis renders it improbable that inflammation is an important factor in most cases. If it were, defective mesenteries would be more frequent also after appendicitis. On the other hand such inflammatory changes may result secondarily because of the defect.

In one case described by the author another anomaly was found in the sigmoid flexure which was adherent, displaced to the right, and suspended from a short mesosigmoid. This condition could not have been caused by inflammation, but must have been of congenital origin, a view supported by the studies of Toldt and Konjetzny. The adhesion of the mesosigmoid to the duodenojejunal flexure and the mesentery of the small intestine has been described by them as a developmental anomaly in the foetus. A shortening of the mesentery with consequent stretching causes the formation of holes. Given this defect, ileus results whenever the intestines, especially the small intestine, become incarcerated in the opening, the gravity of the condition depending upon the degree of the incarceration.

In two of the cases observed by the author there was severe strangulation with alarming symptoms and rapidly spreading gangrene. In one case the obstruction resulted from volvulus of the loop of bowel within the opening in the mesentery. To explain the volvulus Hohlbaum refers to the experiments of Payr on the causes of rotation of the intraperitoneal organs. The diagnosis is difficult. In one instance the condition was diagnosed as appendicitis because of the location of the obstruction. At operation the character of the obstruction is very difficult to determine, and the openings in the mesentery are not easily sutured. To close the hole in the mesosigmoid the author uses the omentum.

HELLER (Z).

**Ross, G. G.: Mesenteric Thrombosis.** *Ann. Surg.*, 1920, lxxii, 121.

Thrombosis of the mesenteric vessels is a condition of interest to the surgeon not only because of its comparative rarity, but also because of its gravity, the difficulty of diagnosis, and the corresponding lack of success in its treatment.

The superior mesenteric artery alone supplies the small intestine and practically all of the large bowel with the exception of the descending colon, the sigmoid, and the rectum. The duodenum has a double blood supply. The superior mesenteric artery is an end artery while the inferior mesenteric is not.

There seems to be no doubt that arterial blocking in the mesentery is far more common than obstruction of the venous circulation.

Arterial obstruction results from embolic plugging of the vessel, thrombotic obliteration, or thrombosis developing at the site of lodgment of an embolus.

Venous obstruction is of an ascending or a descending variety. Whatever the nature of the beginning of the process, its course, prognosis, and treatment are the same.



Ross classifies cases of mesenteric thrombosis into those in which the process is the primary surgical condition, i.e., the condition the surgeon is called upon to diagnose and treat, and those in which the condition follows as a complication or secondary involvement some surgical condition already dealt with.

Elaborate classifications and tabulations of histories and groups of cases have failed to bring out a syndrome upon which even a probable diagnosis can be made safely in a fair percentage of instances. It is true that in some cases, especially those that are postoperative, slow in onset, and of the venous form of thrombosis, there are no symptoms which would even suggest the true condition interfering with the patient's recovery.

When a thrombosis occurs, the blood supply of a certain segment of intestine is stopped or diminished to a great degree. This is followed by a decrease of function manifested by lessened peristalsis. Unless the segment of bowel affected is very minute, the cessation of peristalsis within it soon causes stoppage due to local paralytic ileus, and the signs of intestinal obstruction develop. Further changes, gangrene, perforation, etc., are terminal stages only. So far we have not arrived at a point of diagnostic skill which makes it possible to differentiate with certainty the variety of an intestinal obstruction.

In five of the author's six cases pain was a prominent symptom. In the sixth case the mesenteric thrombosis followed a pelvic operation.

As a result of his study of these and other cases, Ross has arrived at the following conclusions:

1. Arterial mesenteric thrombosis is a lesion causing a form of acute intestinal obstruction which is rare but should be borne in mind.

2. The syndrome of this condition is that of an acute intestinal obstruction which is slower in onset than the purely mechanical forms of acute obstructive ileus (adhesion, volvulus, etc.).

3. Venous mesenteric thrombosis gives rise to more vague symptoms and is slower in its course than arterial obstruction. It has also a more definite tendency to become cured spontaneously and to develop as a secondary or postoperative condition. When a collateral circulation is not established, however, the final symptoms are the same as those of arterial obstruction.

4. The treatment of mesenteric thrombosis is the treatment of any form of acute intestinal obstruction, i.e., early operation. The procedure employed must vary with the condition found. If the vitality of a segment of gut has been gravely affected, resection is indicated. If the patient's condition contra-indicates resection, the gut should be drawn out of the abdomen and fastened to the edges of the wound. A Paul's tube should then be introduced, resection being delayed.

In one case of the author's series a spontaneous cure resulted. While this may occur at times, such isolated instances do not refute the general rule that an early radical procedure is indicated.

GEORGE W. HOCHREIN.

## SURGERY OF THE EXTREMITIES

### DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

**Perthes, G.:** A Contribution to the Etiology of Osteochondritis Deformans, with Remarks on the Articles of Sundt and Waldenstroem (Beitrag zur Aetiologie der Osteochondritis Deformans, nebst Bemerkungen zu den Artikeln von Sundt und von Waldenstroem). *Zentralbl. f. Chir.*, 1920, xlvii, 542.

In discussing the findings in 28 cases of osteochondritis deformans Perthes states that he is not inclined to regard trauma as the etiological factor in most cases although it may be the cause when limping occurs immediately after a slight injury or following jumping or overstraining. In only 2 of his cases was trauma sustained of such a degree that it could have been the cause of the condition, and in these instances it is possible that the disease was present before and was merely called to the patient's attention by the injury.

Sepp considers trauma the only etiological factor but this theory is open to question also in cases in which the condition follows the reduction of a congenital dislocation of the hip. In such cases the disease is sometimes found in the hip which was not

dislocated or reduced. Tromme believes the condition to be the result of late rickets, but in the cases reported by Perthes rachitic symptoms appeared in only 1 instance and in this case were insignificant. Tromme's observation that the disease may occur in other bones than the femur is important. Terkher observed 2 cases in which it was bilateral. In 1 case there was trauma and both hips were affected simultaneously. Brandes assumes that the condition may result from nutritional disturbances due to developmental disturbances. In this connection Perthes presents another case in which the osteochondritis followed mild rheumatic arthritis which was cured in the right hip and other joints but led to nutritional disturbances of the upper epiphysis of the left femur. The left hip had previously been found normal by X-ray examination. RAESCHKE (Z).

**Dieffenbach, W. H.:** Osteomalacia: Is It a Rare or Rather Common Disease? *Med. Rec.*, 1920, xcvi, 995.

During the past few years the author has seen an increasing number of cases of osteomalacia. The same increase was noted by Fromme in Goettingen and in Vienna and is probably the result of

underfeeding due to the war. Many of the patients were referred for chronic rheumatism and arthritic conditions. On the basis of his experience the author draws the following conclusions:

1. Osteomalacia is not an uncommon disease, but as a rule is not recognized until spontaneous fractures call attention to it.
2. Osteomalacia simulates rheumatic and arthritic conditions.
3. In addition to the roentgen picture, which is typical and easily disclosed, there are a sufficient number of clinical manifestations to indicate the presence of the lesion in its early stages.
4. The clinical manifestations include a characteristic short, unsteady gait, the back being bent and the head lowered; indefinite or vague rheumatic pains referred to different articulations; an excess of earthy phosphates in the urine; frequency of the white line of Sargent; and, as the disease continues, diminution in height due to atrophy of the bone or bending of the femur and other long bones.
5. Judging from the endemics in Central Europe the condition seems to be due to undernutrition or improper nutrition with deficiency of lime, phosphorus, and vitamins.
6. Suprarenal, parathyroid, and gonad deficiencies are also noted in cases of this lesion. Whether these are reflexly due to the nutritional defects mentioned or are primary remains to be determined.
7. Treatment by rest, actinotherapy, diet, and endocrine products, especially when the condition is not too far advanced, will be effective.

ADOLPH HARTUNG.

**Law, A. A.: War Wounds of the Major Joints.**  
*Minnesota Med.*, 1920, iii, 337.

The treatment of joint wounds was entirely changed during the world war. Instead of the old accepted theory that the synovia has little resistance to infection it is now believed that it is very resistant.

The principles of treatment of joint wounds instituted by Willems of Belgium and Delore of Lyons are as follows: (1) Early débridement and closure; (2) recognition of the exceptional resistance of the synovia to infection; and (3) immediate and sustained free mobilization of the joint.

This treatment has lowered the mortality from 27.6 to 0.9 per cent, has decreased the mortality of thigh amputation from 30 to 2.8 per cent, and has resulted in a more or less movable joint in about 85.5 per cent of the cases.

Contamination followed all battle wounds in from eight to ten hours, but infection did not supervene until later.

The purpose of early débridement, the ideal treatment, is to remove all foreign bodies, infected material, and devitalized tissue, leaving the wound sterile. If done sufficiently early, primary closure is indicated, but if the wound is contaminated, chemical disinfection and secondary closure are necessary.

A drain may be left down to the synovia, but should never enter the joint. The synovial fluid

remains sterile for sixty hours after the rest of the wound is contaminated.

Active movements should be begun early and continued. If begun early they are not painful. In knee and ankle injuries, if there has not been too much destruction of the joint, walking should be begun on the second day and continued.

When a joint is distended with fluid frequent aspiration is indicated.

If half of a condyle or the articular plateau of the tibia is left a useful joint may be expected. In aseptic joints a large, loose, sterile fragment of bone may be nailed or screwed in place.

In the elbow joint useful function may be expected following a greater loss of structure.

If much bone is lost in the knee or ankle, early use of a hinged splint for mobilization is necessary, but when the popliteal vessels are injured early amputation is imperative.

Willems' open mobile treatment of a septic joint gives the best assurance of a mobile joint.

Joint injuries complicated by comminuted fracture of the long bones were the most serious type during the war. When, in such cases, the fracture itself was immobilized by ice tongs and a splint, it was sometimes possible to mobilize the joint.

Wounds of the shoulder and hip require resection more often than all other types of joint wounds combined.

MARCUS H. HOBART.

**Ely, L. W.: The Second Great Type of Chronic Arthritis: A Laboratory and Clinical Study.**  
*Arch. Surg.*, 1920, i, 158.

The type of arthritis with which this paper deals is characterized macroscopically by cartilaginous and bony lipping at the circumference of the joint, bony spurs at the points of insertion of the capsule, thickening of the cartilage followed by calcification and erosion which leaves the underlying bone bare, condensation of this bone (eburnation) with grooving in the line of joint motion, hypertrophy of the synovial membrane with marked villous formation, and frequently fluid in the joint. Adhesions are seldom formed in such joints, the limitation of motion being due principally to bony distortion.

Microscopically the cartilaginous cells are swollen and arranged in groups which are tattered, irregular, and often bizarre in appearance. Later in the process these cells disappear and the thickened sub-jacent buttress of bone is left bare. The synovial membrane often shows cellular infiltration. The marrow is fatty and fibrous, contains minute spicules of bone and cartilage, and frequently shows areas of cellular infiltration. Rarefaction of the bone near the joint is a prominent feature. Distinct irregular cavities, sometimes resembling cystic formation, are present in a large number of cases. The essential feature of this type of arthritis is an aseptic necrosis with cavity formation in the bone at a short distance from the joint.

Pain, stiffness, deformity, disability, and muscular atrophy of a low-grade form of arthritis are usually



present. The joint is swollen. In the hands the disease attacks by preference the terminal interphalangeal joints—Heberden's nodes. It occurs frequently in the hip, spine, and knee and is considered uni-articular except in the spine and fingers. In spinal affections the pain may be felt in the back, around the trunk, or down the extremities—hence the complaint of neuritis, lumbago, or sciatica.

The first step in the treatment consists of the removal of foci of infection. The vast majority of such patients have alveolar infections. Dry heat, baths, electricity, massage, and Bier's treatment are all of value in relieving the pain. In several cases resection of the involved joint with the production of ankylosis is indicated.

The author draws the following conclusions:

1. The second great type of chronic arthritis has two distinguishing features: (1) bone production (lipping, spurring) at the joint line, and (2) absence of union between the ends of the bones.

2. The chief pathologic feature is the presence of areas of aseptic necrosis in the bone near the articular surface.

3. The primary cause is probably infection in the alveolar processes of the jaw.

4. Alveolar infection causes only this type of arthritis.

5. Tuberculosis, gonorrhœa, syphilis, etc. never cause this type of arthritis.

6. Emotion, impairment of digestion, and trauma are only contributory factors.

7. This type is the senile type of arthritis.

LOUIS HANDELMAN.

**Roberts, P. W.: The Prevention and Treatment of Weak Foot in Children.** *J. Am. M. Ass.*, 1920, lxxv, 237.

In a previous paper the author demonstrated that rotation of the os calcis and its anteroposterior axis determines the degree of strain borne by the longitudinal arch, and that by directing the course of such rotation outward, foot strain may be prevented and weak foot overcome.

Three common factors in the etiology of weak foot are improperly designed shoes, unequal development of the leg muscles, and deviation of the normal mechanical relations between the tarsus and leg.

The most important single factor in preventing weak foot and developing the normal arch is the maintenance of the upright position of the os calcis during the period of growth. This may be done by simply thickening the inner border of the heel or by means of a plate which grasps the heel and holds it in the correct position without interfering with the front of the foot or the muscles and ligaments of the sole of the foot. The author emphasizes also the advantage of muscle training but states that such training can be given only when the child is old enough to co-operate.

In the prophylactic treatment, proper shoes, which are large enough at the ball of the foot to prevent crowding of the metatarsal bones and to

allow plenty of room for the toes to be completely straightened are essential. There are three normal types of feet: the straight foot, the in-flared foot, and the out-flared foot. The popular so-called orthopedic lasts with their inward swing are correct for only one type of foot.

The author calls attention to plates which he has designed to grasp the os calcis and hold it in the correct position.

CARL C. CHATTERTON.

## FRACTURES AND DISLOCATIONS

**Hertzka, E.: Fractures of the Ribs** (Ueber Rippenfrakturen). *Wien. med. Wchnschr.*, 1920, vii, 336.

This article is based upon 576 cases of rib fractures observed at the surgical clinic of the University of Vienna during the past ten years. After a short introductory discussion of the location, course, and important anatomical relations of rib fractures the author reviews the etiology and symptoms briefly.

Hertzka has observed only fractures induced by direct or indirect force. The most common complication is hæmoptysis. Next in order are hæmothorax and skin emphysema. Skin emphysema is due usually to increased intrathoracic pressure with tearing of the pleura. More rarely it is the result of direct injury of the lung by a rib fragment, and when this is the cause the danger of hæmothorax and infection is much greater. In one of the author's cases the emphysema was not observed for several days after the injury.

In the presence of abdominal rigidity and general shock an injection of morphine is indicated early. This leads to relaxation if no other pathologic processes are present. In order to prevent pulmonary complications the patient should get up soon after adhesive plaster immobilization has been obtained. The same procedure is indicated also in uncomplicated cases of hæmothorax as it tends to shorten the duration of disability.

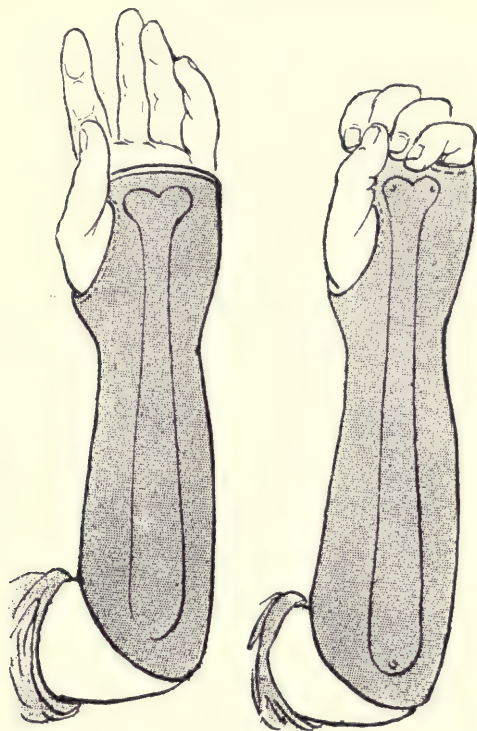
OSKAR MAYER (Z).

## SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

**Desfosses, P.: The End-Results of Resections of the Wrist** (Les résultats éloignés des résections du poignet). *Presse méd.*, 1920, xxvii, 893.

Farabeuf holds that the outcome of resections of the wrist has been very poor, especially in military surgery, but that the technical progress of the latter period of the war was an improvement over that of the first year.

In order to show the poor results obtained he describes a number of typical cases of resection of the wrist following traumatism by war projectiles. Excision of the entire carpus and of the lower extremity of the cuboid was done in the case of a wounded man whose left hand was hanging useless. Movements of flexion, extension, supination, and pronation were impossible. There was only a slight adduction and abduction of the thumb against the index finger; the other fingers were absolutely use-



Author's splint allowing flexion of hand.

less. In another case the hand was ankylosed in flexion on the wrist. Resection was limited to the carpus, the lower extremity of the bone of the forearm being left intact. In a third case resection in which the pisiform was left in place gave a result which was no better. A fourth patient had a wide excision of the lower extremity of the bone of the forearm which allowed the hand relative freedom of movement. A supportive splint made it possible for the hand to execute movements of flexion. When the carpus was left, even if the loss of bone substance was slight, the functional result was generally poor.

In the only successful resection for arthritis the trapezium, the pisiform, and the lower extremity of the radius were left intact.

The danger of wrist resections lies in the possibility that ankylosis will result. In wrist resections, as Farabeuf first taught, the vessels, nerves, tendons, and muscles must be carefully preserved. During the postoperative period daily passive and active movements are necessary in order to combat muscular atrophy.

A. J. SCHOLL, JR.

**Meyer, H.: The Plastic Repair of the Thumb** (Der plastische Ersatz des Daumens). *Beitr. z. klin. Chir.*, 1920, cxix, 386.

The author discusses the various methods which have been proposed for the repair of the thumb and

describes two of them in detail. In the first of these two methods the surrounding tissues are utilized. The flap is made as in the stump operation of Schmidt-Krukenberg or according to Luksch's method, and an osteotomy and axis rotation are done. In the second method, either a pedunculated flap, a movable flap of skin of some other part of the body, a bone chip, or a toe graft is used. The method to be employed will depend upon the patient's age, occupation, and social status.

The author advocates the use of the pedunculated flap when the patient is a manual laborer, as this gives a strong working thumb. In the cases of mental workers he does toe-grafting. When it is not necessary to take the patient's occupation into consideration or when the patient is elderly, the splitting or finger-graft method may be tried. If other fingers also are involved by the injury, the finger-graft method is of great value, but for young persons the toe-graft method is preferred. In recent hand injuries the insertions of the small muscles must be preserved if possible, and therefore the dislocation of the middle finger must be prevented. Denuded or mutilated fingers should be covered immediately with body skin. When it is necessary to amputate a finger because of deficient blood supply, the removed bone should be grafted into the abdominal tissues at once and left there for later plastic use. The author reports 4 of his own cases.

W. V. SIMON (Z).

**Galloway, H. P. J.: The Open Operation for Congenital Dislocation of the Hip.** *J. Orthop. Surg.*, 1920, ii, 390.

Galloway attempts to discredit the accepted treatment of congenital dislocation of the hip by reporting the results in 31 cases. He describes Lorenz's teachings of bloodless reduction as "seductive demonstrations," belittles the results obtained by Wilson, and praises and seconds Sherman's "unanswerable line of argument against manipulative reduction." Admitting that orthopedic men will hesitate to adopt the cutting operation for reduction of hip dislocations, he states that although the bloodless method represents a considerable advance over the former diagnosis of the condition as incurable, it does not effect a real cure.

The author lays down the following dogmatic principles:

1. All cases should be treated by open operation, never by manipulation alone.
2. The common teaching that open operation should be reserved for cases in which treatment by manipulation has failed, is wrong.
3. The best age for open operation is between 2 and 3 years.
4. For this operation there are two methods of approach the anterior being the easiest, but the posterior being preferable when exceptional difficulty is anticipated.
5. In single dislocations there is no age limit for open operation.



6. In double dislocations both hips should not be operated on at one time. At least eight weeks, and if necessary, a year, should elapse between the operations.

In the anterior route, the incision is made below the anterior superior spine and continued between the tensor fasciæ femoris and the rectus femoris. After the division of the tissues along the front of the iliac crest, the femoral head is exposed by a longitudinal incision of the capsule, the constricted portion of the capsule (which the author insists is always present) is incised, and the reduction is obtained by combined manipulation and the aid of a gouge chisel to act as a "shoehorn." The thigh is finally put up in plaster in position of full extension, with 25 degrees flexion of the knee, 60 degrees of abduction, and some internal rotation.

In the posterior route, the incision extends from the upper border of the trochanter down along the outer side of the femur. The upper part of the trochanter is denuded, and the capsule exposed. In cases demanding the use of the posterior route, excavation of the acetabulum and tenotomy of the adductors may be necessary. If the "shoehorn" instrument will not then effect the reduction, removal of the head and neck or even a portion of the upper extremity distal to the femoral neck may be necessary before the femur is implanted in the acetabulum.

Galloway analyzes the results of a total of 38 operations. In 12 cases a cure was obtained and in 14 the deformity was greatly improved, the lordosis being corrected and the stability of the hip greatly improved. In 1 case, however, the X-ray showed the head to be out of the socket, in several there was limitation of motion, and in a few, complete ankylosis. Eight especially difficult and unusual cases are reported. In 1 of these death resulted from streptococcic poisoning. In another, that of a girl 11 years of age, excision of the head, neck, and part of the trochanter was necessary to effect the reduction. In a fourth, a case of double dislocation, recurrence of the dislocation of the first hip necessitated a second operation. Another case, that of a patient 13 years of age, required arthrodesis of the hip. An excellent result was obtained after redislocation. Motor paralysis was present in 1 case, and in another a primary tenotomy of the adductors was followed by heavy traction. In the last case mentioned, that of a woman 36 years of age, excision of the head, the neck, and a portion of the trochanter was necessary. ROBERT G. PACKARD.

**Borchgrevink, O.: Amputation of the Leg.** *Ann. Surg.*, 1920, lxxi, 697.

To assure solidity of the artificial limb the leg should be amputated at least 22 cm. from the ground, or roughly, about the middle of the tibia. This can be done best by removing the fibula, making the scar so that it escapes pressure from the prosthesis. Ligation of vessels should be avoided as much as possible as it interferes with the nutrition

of the flaps. The tendon of the biceps and other soft parts should be separated as close to the fibula as possible without injury to the periosteum or the insertion of the muscle into the external tuberosity of the tibia. Every part of the stump should be covered carefully with fascia. The scar must not pass over the end of the tibia, but should be situated posteriorly, at least 3 cm. above the end of the stump.

Following such an amputation the weight is supported by the tuberosities of the tibia and its lower end as well. The peroneal nerve is exposed behind the head of the fibula and amputated high up so that it cannot be compressed by the artificial leg. In many cases this gives relief and is a strong argument in favor of removing the head of the fibula.

If the stump is more than 15 cm. long, the upper end of the fibula may be removed, a portion being left below about which the bucket of the leg can be fitted. This may prevent sliding within the bucket which at times is troublesome and will reduce the amount of fitting to the thigh. Postoperative changes in a stump continue for one and one-half or two years after operation. The author cites 16 cases in which he believes the results were greatly improved by the removal of the upper end of the fibula.

The leg bucket must be made to fit accurately so that the weight will be evenly distributed. This can be done most readily by moulding the bucket of some plastic material and then hardening it in the form desired. GATEWOOD.

**Meehan, A. V.: War Amputations of the Lower Limb.** *Med. J. Australia*, 1920, i, 571.

In all amputations above the lower third of the leg an effort should be made to conserve every available inch of bone so as to provide the longest possible lever to carry the weight of the artificial limb.

In primary amputation for trauma, the guillotine operation meets all requirements. All devitalized tissue is removed, as much of the bone being conserved as possible. Early skin extension is advisable.

Early interference after primary amputation is a serious mistake. Re-amputation or plastic surgery should not be attempted before at least six months, and when complications are present the interval should be longer. The secondary operation on guillotine stumps consists in freely excising the scar *en masse* down to the end of the bone and undermining the plane of fascia sufficiently to allow closure. No muscle need be included in the flaps. If the skin edges cannot be approximated without undue tension, sufficient bone is removed to allow accurate approximation. Below the knee the fibula should be divided 2.5 cm. above the plane of section of the tibia. All nerves should be dissected up and divided. The author discusses the question of scar sites in detail.

Meehan prefers the amputation of Syme to that of Chopart because the latter often results in a



disabling equinus deformity and prevents the proper use of the conserved ankle joint. If in injuries of the lower third of the leg Syme's amputation is impossible the site of election is through the middle third of the leg. Amputation stumps below this level heal slowly and are poorly nourished, and the scar tends to break down readily.

The author discusses also the question of amputation in the neighborhood of joints and the treatment of deformities of the hip joint. Early massage and movements of the stump and the wearing of a temporary peg leg as soon as possible are advised. The article is concluded with some practical remarks on weight-bearing surfaces and stump fitting.

LIONEL D. PRINCE.

**Brandão Filho, A.: A New Method of Approaching the Crossed Ligaments and Semilunar Meniscus** (Nova técnica para abordar los ligamentos cruzados e meniscos semilunares). *Brazil-méd.*, 1920, xxxiv, 247.

The author's method of reaching the crossed ligaments and semilunar menisci has been successful experimentally but has not yet been tried on man. A U-shaped incision is made first, its horizontal portion corresponding to the tuberosity of the tibia. The vertical incisions are then carried two or three finger widths from the base of the patella. The flap formed is thrown back and the patella incised on each side, two other perpendicular incisions being carried up to the site at which the patellar ligament is inserted so that they include a little of the ligament itself. A pear-shaped incision is then traced on the anterior surface of the patella, the patella placed in a vertical position and the incision cut with a Gigli saw. Access to the articular cavity is thus obtained.

In the author's opinion the pear-shaped incision, which is the principal point of the technique, is superior to an S-shaped incision or any lateral arthrotomy and less difficult to execute.

W. A. BRENNAN.

**Spiers, H. W.: The End-Results of Hallux Valgus Operations: A Report of 96 Cases at the Orthopedic Clinic of Massachusetts General Hospital since 1905.** *J. Am. M. Ass.*, 1920, lxxv, 306.

Because operations for hallux valgus are so often unsatisfactory the author reviews the results of surgical treatment in 96 cases in the hope at arriving at a satisfactory procedure.

The most frequent operation for hallux valgus in the series was resection of the head of the metatarsal bone. Of 78 operations, 61 per cent were satisfactory.

In 8 cases in which only the exostosis was removed the operation was a failure in 75 per cent.

The Kellar operation was done in 7 cases and was successful in all.

In the author's opinion the failure of complete excision was due to the loss of the foundation of the weight-bearing pillars of the transverse arch.

Metatarsalgia, painful plantar callosities, painful ankylosis, and spur formation were frequent sources of trouble. When only the exostosis was removed the relief was of brief duration.

The author strongly recommends the Kellar operation for bunions. In this procedure an inverted U incision avoiding the bursa is made, the exostosis and a good portion of the dorsal surface of the head of the first metatarsal are removed subperiosteally, and the proximal end of the proximal phalanx is excised sufficiently to obtain the correct alignment.

This method preserves the cartilages of the joint in the weight-bearing surface and corrects the deformity by shortening the toe and removing the exostosis. At the same time it interferes little with the muscular attachments. The cosmetic and functional results in all cases have been good.

CARL C. CHATTERTON.

**Mayo, C. H.: The Surgical Treatment of Bunions.** *Minnesota Med.*, 1920, iii, 326.

Hallus valgus occurs chiefly in women who wear shoes which are too short and have misshapen toes and high heels. A shoe too short or with pointed toes causes the great toe to turn out, while a high heel obviously causes the wearer to walk on an inclined plane. The sesamoid bones become enlarged and at times develop under the head of the fifth metatarsal bone.

Hallus valgus is usually associated with some degree of bunion. The overgrowth of bone of the head of the first metatarsal bone has been attributed to intermittent pressure regardless of the fact that roentgenograms show a wide separation of the heads of the first and second metatarsals. If pressure alone were the cause of bunion it seems that there would be a narrowing of the space between the first and second metatarsal bones rather than wide separation. The overgrowth of bone the author believes is due probably to the same factor that is found in chronic rheumatoid arthritis, that is, a low-grade infection, the local pressure and trauma being predisposing factors since hallus valgus and bunion generally occur in the period of life in which rheumatoid and recurrent infections are most prevalent. Bunions are commonly found on feet with long great toes rather than on those with short toes, because of the great leverage of the former. In hallus valgus there is often a displacement of the flexor tendon of the great toe which allows the sesamoid bones to slip between the heads of the first two metatarsal bones, wedging them apart when the weight is placed on the foot.

Some degree of arthritis is far more commonly associated with flat foot than generally is supposed. A bunion associated with flat foot is serious since the benefit of an operation is less and the recovery much slower than in cases without such a complication.

Many methods have been devised for the operative treatment of bunions. The operation of choice is one advocated some time ago by the author. The



great toe is shortened and the extensor tendon relaxed. One quarter inch of the articulating surface of the head of the first metatarsal bone is removed and motion is maintained by turning the bunion bursa over the end of the divided bone and into the joint after the bony overgrowth has been removed. In cases of flat-foot with hallus valgus and bunion the head of the metatarsal bone and the bunion bursa should be preserved and the overgrowth of bone and the sesamoids removed. B. R. PARKER.

### ORTHOPEDICS IN GENERAL

**Cooper, G.: The Treatment of Muscular Atrophy by Artificial Stimulation.** *J. Roy. Army Med. Corps*, Lond., 1920, xxxv, 37.

Muscular injuries are classified according to their etiology as: (1) those due to direct trauma or the action of toxins on the muscle fibers, and (2) those due to the suspension of the function in the muscle.

Trauma may cause loss of muscle substance with replacement by fibrous tissue or injury to the nerve supply. Such loss generally results in a fibrous contracture or a loss of contractile power.

There are three types of atrophied muscles:

1. Those due to a lesion of the lower motor neurone, the result largely of injuries of peripheral nerves.

2. Those due to immobilization of neighboring joints by splints.

3. Those in which contraction is inhibited by pain in the joints which they control, as in wasting of the quadriceps in arthritis of the knee.

The author outlines the physiology of muscle. Muscle fibers contract, either to nerve impulse or direct stimulation. During contraction lactic acid is formed. During relaxation there is oxidation of carbohydrates; oxygen is consumed and CO<sub>2</sub> is produced. The carbohydrates are undoubtedly drawn from the lymph through the limiting membrane of the muscle fibrils, and the exchange must take place during contraction and relaxation. In the treatment, therefore, an attempt must be made to cause rhythmical muscular contraction.

The treatment of muscle by active contraction is not considered in this paper. Especial reference is made to muscles the condition of which is such that their response to active contraction is too feeble and ineffective to bring about a sufficient interchange between the elements mentioned and the surrounding bloodstream. The methods used most commonly for artificial stimulation are massage and electricity.

The response of a muscle with interrupted nerve supply to manipulation is very feeble, and the effect of such manipulation is due to mechanical stimulation of the vasomotor system. When the nerve supply is intact, however, the contractions are largely the result of stimulation of the muscle fiber through the muscle plate.

For electrical stimulation the faradic or interrupted galvanic current is used. Stimulation takes

place only at the make and break of the current. A constant current is incapable of producing contractions in muscles. Degenerating muscles will not react to currents of brief duration set up in the ordinary induction coil or faradic battery.

To produce contraction in muscles by electrical stimulation the current must have a minimum intensity and this minimum current must be continued for a definite time. This period of time varies according to the velocity of excitability of the muscle. In normal muscles it is about one thousandth of a second, while in paralyzed muscles it may reach fifty thousandths of a second.

The selection of a proper current is governed by two considerations: (1) the degree of the contractions, and (2) the degree of pain caused by the current.

The normal rate of stimulation is much greater than has been supposed. Heretofore the normal rate has been considered only about forty per second.

Sensation is influenced by the length and uniformity of the waves and interruptions. With long waves there is pain.

With Dean, the author has produced a coil which causes less pain and is more effective than the Wilson faradic coil. The Frimandeau coil for interrupted galvanic currents is the type most commonly employed for the stimulation of muscles.

The author has proved that artificial stimulation will bring about an improvement in the size and tone of a muscle group even when there is complete interruption of the nerve supply.

DANIEL H. LEVINthal.

**Ducroquet, C.: Infantile Hemiplegia; A Functional and Therapeutic Study** (Hémiplégie infantile: étude fonctionnelle, thérapeutique). *Presse méd.*, 1920, xxviii, 504.

The lesions characteristic of infantile hemiplegia appear to originate in the joints. The tibiotarsal joint alone may be involved, but if the knee is affected the ankle joint is abnormal. When the center which controls the hip is altered both the other centers are also markedly involved. The lesions proceed from the distal to the proximal end of the extremity.

In examining patients with hemiplegia it is necessary to know the intensity of contraction of the diseased muscles. This is a variable quantity and diminishes from the tip to the base. The amount of active function of the muscles reveals the extent of voluntary movement which the subject is capable of exerting.

In infantile paralysis a muscle does not respond if it is paralyzed, but if the paralysis is incomplete it executes the movement without force in the same length of time required by a normal muscle to perform it with force, and with the same amplitude as the normal muscle.

In hemiplegia there is a characteristic slowness of response due to the resistance of opposite sets of

muscles. If the injury to the joint center is not extensive, the rapidity of movement may be diminished only slightly.

In infantile paralysis deformities of the lower extremity are frequent, especially those of the sole of the foot. Deformities of the knee joint, which are rather rare, consist of an irreducible flexion varying from 10 to 15 degrees which is mechanically fixed by an osseous deformity and retraction of the posterior part of the capsule. In hemiplegic subjects the degree of limping depends on the number of joints involved. Generally the foot is in an equinus position and there is almost constant partial flexion of the knee. In some cases the foot is fixed and constantly flexed; the subject walks as if the knee were ankylosed in flexion. The hip joint is the only mobile articulation. In cases of fixation of the hip the leg serves merely as a means of stationary support.

There are several important phenomena which occur after muscular contraction of the lower extremity. The swinging of the shoulders, which is

due to retarded action of the pelvic muscles, is either an isolated movement or coincident with the general movement. The shoulder movement is probably a compensatory movement to preserve balance. Contraction is followed also by a muscular unbalance which is characterized by a typical elevation of the deformed foot 3 or 4 degrees above that of an equinus.

Active movements of the knee and hip augment the muscle value and develop rapidity of contraction. Passive movements should be followed by active movements in order to stretch the shortened muscles.

In the treatment of young children mechanical appliances should be used to keep the foot in flexion. Contracture of resistant muscles may be overcome by the application of several successively straighter plaster casts. Mechanical fixation of the knee will shorten the time of treatment and give a better end-result. Tenotomy also will shorten it, but is possible only in severe cases of equinus.

A. J. SCHOLL, JR.

## SURGERY OF THE SPINAL COLUMN AND CORD

**Fischer, O.: A Contribution to the Pathology of the Sympathetic Nervous System; A Case of a Lesion of the Spinal Sympathetic and a Case of Injury to the Ganglion of the Sympathetic** (Zur Pathologie des Sympathicus; Ein Fall von Laesion der spinalen Sympathicusbahn und ein Fall von Verletzung des Grenzstranges des Sympathicus). *Ztschr. f. d. ges. Neurol. u. Psychiat.*, 1920, lxx, 343.

The author reports two cases of gunshot injuries from which he draws conclusions regarding the pathology of the sympathetic system. In the first case there was an injury in the region of the fourth and fifth cervical vertebrae and a grazing shot-wound of the right border of the cervical cord. The symptoms of the injury to the right spinal sympathetic were ptosis, myopic pupils, weeping eyes, and infection of the conjunctiva. Other symptoms were loss of function of the sweat glands of the neck, loss of pupillary reaction to adrenalin or cocaine, and hyperæsthesia of the neck in the region of the third and fourth cervical vertebrae. From the position of the bullet it was evident that the cervical sympathetic was intact and that only the central sympathetic fibers in the cord were injured.

In the second case there was a bullet wound on the right side near the sixth dorsal vertebra. The symptoms were ptosis, contraction of the pupils, absence of pupillary reaction to adrenalin or cocaine, hyperæmia of the conjunctiva, weeping on exposure to the wind and cold, absence of sweat secretion on one-half of the head, right arm, and shoulder, anæsthesia over the outer and under surface of the right arm and little finger, and weakness in the right arm. The author considers this a typical syndrome of an injury to the right cervical sympathetic extending

to about the fifth dorsal segment. It was evident that the lesion involved the sympathetic ganglion and affected all the segments lying above it.

The author's views are confirmed in the literature. The sympathetic nervous system regulates sensibility, hypofunction of the system resulting in hyperæsthesia and vice versa. The experiments of Trendelenburg and Bumke also confirm these conclusions. That nicotine is a specific poison to the sympathetic is evident from other studies. It leads first to stimulation and then to paralysis of the nerves.

The author draws the following conclusions:

1. The sweat glands which supply the skin are innervated by the sympathetic segmentally.
2. Lesions of the sympathetic ganglia have deleterious effects on all the organs above them which are innervated by the sympathetic, including the cervical sympathetic.
3. Lesions of the sympathetic ganglia result in disturbances of the sensibility of the skin above the lesions and motor disturbances which, with the simultaneous sensory disturbances, are attributable to reflex influences of the gray matter of the spinal cord.
4. The sympathetic fibers in the cervical cord lie in the ganglion and are straight.
5. When these central fibers are injured the pupils react in the same manner as following a lesion of the sympathetic ganglia in the thorax or the cervical sympathetic.

From his experience and experiments and from a review of the literature Frank concludes that striated muscle is innervated directly by the sympathetic system. In the author's opinion the sympathetic



exerts an indirect influence on the muscle through the motor roots of the spinal cord. Both views have this in common: they admit that injuries to the sympathetic influence voluntary movements.

MAX WEICHERT (Z).

**Nové-Josserand, G., and Rendu, A.: Sacralization of the Fifth Lumbar Vertebra and Its Complications** (La sacralisation de la 5e lombaire et les accidents qui en résultent). *Presse méd.*, Par., 1920, xxviii, 514.

The authors review the history and pathologic anatomy of sacralization of the fifth lumbar vertebra. They observed 5 cases at Lyons and found the anomaly also in 14 other cases in which a radiograph of the pelvis was made for suspected renal calculi. The authors believe that morphological variations of the fifth lumbar vertebra are rather frequent and will be found in many painful conditions of the sacral and lumbar regions.

In the 19 cases observed by the authors there was symmetrical and bilateral sacralization in 6, asymmetrical bilateral sacralization in 8, and unilateral sacralization in 5. In 12 of these cases there was actual contact or articulation of the apophyses with the pelvic bones. In the authors' opinion there is a certain relationship between attenuated forms of spina bifida and sacralization of the fifth lumbar vertebra.

The authors believe that Italian surgeons have somewhat exaggerated the part played by the nervous system in this condition. Compression of the fifth lumbar nerve has not been established definitely as the location of the pains is not exactly that of the distribution of the nerve. In 3 of the authors' cases in which a most careful examination was made there was no evidence of radiculitis.

The authors' theory regarding the pathogenesis of the condition is as follows:

As is well known, the spinal cord in its development ascends in relation to the spinal column. Its terminal cone, which in the infant descends as far as the third lumbar vertebra, is found in the adult between the first and the second lumbar vertebrae. It would not be impossible, therefore, for sacralization of the fifth lumbar vertebra to be associated with a certain amount of disturbance in the reciprocal relations of the spine and cord which would compress the nerve roots even if there were no hypertrophy of the transverse apophysis. This hypothesis is favored by the relatively frequent association of fifth lumbar sacralization with spina bifida.

In the differential diagnosis between sacralization of the fifth lumbar vertebra and Pott's disease of the lumbar region the following facts should be borne in mind:

1. The resemblance of the symptoms of sacralization to those of other affections becomes more vague as the examination proceeds.

2. The mode of appearance and the evolution of the symptoms of sacralization are often very characteristic.

3. In sacralization the situation of the pains is the same as that of the sacralized vertebra.

4. The demonstration of an osseous contact in multiple radiographs favors the diagnosis of sacralization.

With regard to the treatment the authors state that the results of radical intervention are neither sufficiently clear nor definite to warrant operation as a routine procedure. Surgical treatment is indicated, however, in severe cases in which there is progressive neuritis.

WILLIAM A. BRENNAN.

**Vanderhoof, D.: Spondylitis and Abdominal Pain, with a Discussion of Nerve-Root Symptoms Simulating Visceral Disease.** *J. Am. M. Ass.*, 1920, lxxiv, 1689.

Hypertrophic spondylitis has been diagnosed more frequently since the discovery of the roentgen rays. Until recently very few cases were reported in the literature. At present the orthopedist regards spondylitis as a rather common affliction.

In a series of 87 cases of spondylitis seen by the author there was abdominal pain in 40. In 17 of these visceral disease was demonstrated and the rôle played by the spondylitis was questionable or negligible. In 23 cases careful studies excluded visceral disease as the cause of the complaints.

The pain in spondylitis varies according to the extent and location of the inflammatory process. Arthritis is frequently associated with hypertrophy of bone, atrophy of cartilage, and calcification of ligaments which cause pain and muscle spasm in the back, limit the movement of the spine, and cause gradually developing rigidity. If the rib articulations are involved there is pain on breathing or complete absence of thoracic breathing.

Pressure on the nerve roots or inflammation by extension gives rise to sensory disturbance characterized by pain in the distribution of the nerves. This pain may vary from a dull aching or drawing sensation to the most agonizing paroxysms.

The thoracic, abdominal, brachial, and sciatic pains of spondylitis may occur on one or both sides of the body. When bilateral, they are usually more severe on one side.

Referred pains are usually increased by movements of the body and relieved by rest in the recumbent position. Sometimes pain occurs during sleep and in such cases is probably due to muscular relaxation.

Referred pains of spondylitis have been confused with lesions of the kidney, prostate, seminal vesicles, appendix, and gall-bladder. In 2 of the author's cases the nerve-root pains were acute and similar to tabetic crises.

Vanderhoof abstracts 6 illustrative cases of referred pain in spondylitis showing that despite a very complete examination spondylitis may be overlooked when the nerve roots are involved.

Of the series of 87 cases reviewed, 60 were those of males and 27 those of females. Most of the patients were over 40 years of age.

D. H. LEVINTHAL.

## SURGERY OF THE NERVOUS SYSTEM

**Tranter, C. L.: Formication Test in Peripheral Nerve Injuries—Its Interpretation.** *California State J. Med.*, 1920, xviii, 248.

Tranter's paper is based on his experience with over 1,000 cases of nerve injuries observed from a few days to eighteen months after the receipt of the wound, and upon the observations of the work of Tinal and his associates.

Formication does not appear immediately after an injury even if there has been an immediate suture, but is noted only after a lapse of from four to six weeks. The rate of regeneration may vary more or less according to the general health, the age, and the recuperative powers of the individual and the character of the injury.

Two determinations necessary for the correct interpretation of the test are:

1. A comparison of the intensity of the formication elicited at the level of the lesion with that elicited at the lower limit of the zone of formication.

2. Measurement of the length of the zone of formication and the determination of the average daily rate of regeneration.

The lower limit of the zone of formication should be determined by light percussion well distal to, and gradually approaching, the lesion. Percussion with the finger tip is preferable to the use of a percussion hammer. The limb should be flexed to insure relaxation of the nerve and should not be cold. The patient should not be allowed to look at the region percussed. To determine the average daily rate of regeneration twenty days should be allowed after the date of injury for recovery from the retrograde changes following section. The average daily rate of regeneration in young healthy subjects is between  $1\frac{1}{2}$  to 2 mm. When regeneration is satisfactory, the intensity of formication below the level of the lesion is always as great as that above.

Complete interruption is indicated by fixity of formication at the level of the lesion on repeated examinations or by formication of diminished intensity below the level of the lesion and a subnormal rate of regeneration. Either finding should warrant surgical exploration. The formication test gives definite evidence of regeneration long before muscle reflexes appear and before voluntary motion becomes possible.

CARL R. STEINKE.

**Lewis, D.: Principles of Peripheral Nerve Surgery.** *J. Am. M. Ass.*, 1920, lxxv, 73.

When a nerve is divided, definite evidences of regeneration are noted within a few hours in the proximal segment adjacent to the point of injury.

Definitive regeneration of neuraxes occurs only in the proximal segment. All the neuraxes that eventually neurotize the distal segment passing into the motor end-plates and sensory endings develop from those of the proximal segment.

The changes that occur in the distal segment after division are as important as those occurring in the proximal segment. Nerve impulses cannot be transmitted without neuraxes, but the neuraxes cannot reach their terminal distribution unless bands or conduits are formed along which these can pass.

In the repair of a divided nerve it is essential first of all to provide easy access for the developing neuraxes to the distal segment. Neuromata develop in nineteen days even when there is no hæmorrhage or infection.

Scar tissue forming after the division of a nerve interferes most seriously with nerve repair. Suture by neuroma is ineffective. All neuromata should be resected until healthy funiculi are seen and to the point where scar tissue is not visible to the naked eye.

Success in peripheral nerve repair depends on accurate anatomical approximation of the two ends. The importance of the internal topography of peripheral nerves should be emphasized. Non-axial rotation during suture is important as distortion of the nerve pattern is thus avoided.

Accurate approximation will prevent to a great extent imperfect redistribution of developing neuraxes. Imperfect redistribution occurs to some slight degree after every suture, but may be overcome by re-education or degeneration of the fibers which have made wrong terminal connections.

The length of time intervening between the division of the nerve and the repair is an important factor in determining the success of nerve suture. When nerve suture is performed early and the period between the injury and the operation does not exceed three or three and one-half months the percentage of recoveries is much higher than when the suture is performed later.

End-to-end suture is the only procedure that can be relied on to re-establish the continuity and function of a nerve after division. Transfixation sutures do not disturb the nerve pattern, but epineural sutures are the most satisfactory. The sutures should be applied so that the epineurium is closed in order to prevent the straying of the neurofibrillæ into the surrounding tissue.

Mobilization of the segments, especially when it is combined with displacement of the nerves and a change in the position of the part, will often permit end-to-end suture even when the defect is long. Autogenous cable transplants and tubulization with fascia are used when there is wide separation but give very poor results; in the author's twelve cases treated in this way no recoveries were obtained.

In civil practice a case of nerve severance should be operated upon sooner, without waiting for partial recovery. After operation careful supervision, exercise, and passive motion of the part are necessary.

HOWARD A. MCKNIGHT.



**Huber, G. C., and Lewis, D.: Amputation Neuro-mata: Their Development and Prevention.** *Arch. Surg.*, 1920, i, 85.

Huber and Lewis report a series of experiments made on rabbits to determine the factors which cause, and the means of preventing, neuroma formation. Their conclusions are as follows:

"1. A neuroma indicates an attempt, which is thwarted or blocked by scar tissue, on the part of the neuraxes of a divided nerve to seek the distal segment and thus complete nerve repair.

"2. When blocked, the regenerating neuraxes form spirals and end-disks and become irregularly dispersed throughout the connective tissue of the bulb.

"3. The regenerating neuraxes react on the connective tissue elements of the bulb, which as a consequence increase in number and maintain their embryonal characteristics longer than is normally the case.

"4. The 'swing door' or reversed V operation and the crush and tie operation do not prevent neuroma formation.

"5. Any method to be successful must be directed against the neuraxes.

"6. Absolute alcohol injected into the nerve some distance (from  $\frac{3}{4}$  to 1 in.) above the plane of section is more successful in preventing neuroma formation than any of the other methods ordinarily employed."

HENRY J. VANDEN BERG.

## MISCELLANEOUS

### CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

**Thompson, J. E.: Surgery and Embryology.** *Surg., Gynec. & Obst.*, 1920, xxxi, 18.

In this article a few surgically important abnormalities are considered. Some of these deviations from the normal may be better understood when a comparative study of the human body and the lower vertebrates is made. The dissecting room shows that the most common anomalies occur in the arteries. Next in frequency are intestinal abnormalities which are due for the most part to the arrest or failure of the colon to rotate. The author outlines the development of the small and large intestines minutely.

Cysts of the neck of branchial origin may be classified as follows:

1. Lymphatic cysts. These are derived from the lymphatic sinus in the third month of foetal life and are situated in the lowest part of the posterior triangle of the neck.

2. Thyroglossal cysts. These occur in the midline above or below the hyoid bone and are derived from the thyroglossal duct.

3. Thyroid gland cysts. These are found in the lateral lobes of the thyroid gland and result from cystic degeneration of adenomata.

4. Sequestration cysts. These occur in the midline and are due to inclusion of the epiblast during the fusion of the ventral folds of the embryo.

5. Branchiogenetic cysts. These are remains of the external branchial depressions of the embryo.

A detailed review of the development of the branchial arches and clefts is given, and cases illustrating some of these cysts are reported.

The author believes that ranula, submaxillary cysts, and deep cervical cysts are derived from vestigial remains of the branchial clefts and that their subsequent position depends upon the shifting of muscles during the formation of the neck.

ISADORE E. BISHKOW.

**Braun: The Results of Friedmann's Treatment in 80 Cases of Surgical Tuberculosis** (Die Ergebnisse der Friedmannschen Behandlung von 80 Faellen von chirurgischer Tuberkulose). *Deutsche med. Wchnschr.*, 1920, xlv, 596.

The cases of surgical tuberculosis reported were of different types and the patients of different ages. Seven of the 80 cases are disregarded in the discussion of the end-results as 2 of the patients died shortly after the treatment was begun and 7 died before the treatment had been given for a sufficiently long time to cause improvement. Sixteen of the patients were either benefited or cured, but the improvement could not be attributed solely to the Friedmann treatment as surgical therapy was also given and the casts and extension might have proved effective without the serum.

In 29 cases the condition remained unchanged or became worse. In 20 cases, however, the favorable effect of the Friedmann serum was clearly evident and in some instances was noted after a few days. In 8 cases the treatment exerted a distinctly unfavorable effect, causing an acute exacerbation of the tuberculous process. This may have been due, however, to improper dosage, especially excessive dosage. The correct dosage must be determined from experience. Friedmann's directions cannot be followed exactly in practice.

ADLER (Z).

**Deve, F.: Alveolar Echinococcosis in Man and Bovine Multilocular Echinococcosis** (Échinococcose alveolaire humaine et échinococcose multiloculaire bovine). *Anal. Fac. de Med. Univ. de Montevideo*, 1920, v, 129.

It is generally believed that the bovine multilocular echinococcosis and human alveolar echinococcosis are identical.

In an article based on the macroscopic, histologic, and zoologic characters of the two lesions published in 1905, Deve maintained that the two affections are not identical. This conclusion has been recently challenged by Llambias. On the basis of a study of

certain embryonic forms and pseudo-gigantoblasts, Llabias concludes that bovine multilocular echinococcosis is identical with the human type.

In this article Deve defends his former position and submits a number of histologic plates comparing the human and bovine types of the condition. He states that the bovine lesion is not identical with the lesion in man in its general texture or the details of its histopathologic structure. The bovine type differs from the human type by its cyst formation, its circumscribed location, and its benign character as well as in its morphological and biological characteristics. Moreover, while the parasite in the two lesions shows the same elementary structure, the organism found in the bovine lesion seems to lack the uniform and definite microvesicular aspect and is not malignant. In the bovine type the multilocular aspect easily passes into the common hydatid form and there is absence of the plasmodial prolongations making for intimate penetration; hence there is an absence of metastasis into the glands and viscera.

Despite the differences mentioned, however, it is not known whether the multilocular echinococcosis observed in animals represents the bovine form of true alveolar echinococcosis, and no conclusion can be drawn from this condition in animals regarding alveolar echinococcosis in man. Experimental investigation alone will be able to answer this long debated question. In the meantime much valuable information might be obtained from a study of the etiological and pathogenic conditions of outbursts of alveolar echinococcosis in countries such as Uruguay and the Argentine Republic.

W. A. BRENNAN.

**Blank, G.: The Blood Findings in Hyperthyroidism and Struma** (Blutbefunde bei Hyperthyreose und Struma). *Deutsche Arch. f. Klin. Med.*, 1920, xxxii, 16.

The author points out the difficulties in examinations of the blood, especially in hyperthyroidism, and states that even in normal persons decided differences are found. He regards the following as the normal leucocyte count: neutrophiles, from 60 to 65 per cent; eosinophiles, up to 5 per cent; mast cells, up to 1 per cent; large mononuclears and transitionals, up to 7 per cent; and lymphocytes, from 25 to 35 per cent.

Blank studied 17 cases of true Basedow's disease, 28 cases of hyperthyroidism resembling Basedow's disease, and 41 cases of so-called ordinary struma.

Poikilocytosis was present in one-third of the cases of hyperthyroidism or twice as often as in the cases of struma. This the author believes was due to increased stimulation of the blood-forming organs. In 3 cases the poikilocytes disappeared in from five to seven days after the goiter operation. One-half of the cases of true Basedow's disease showed thrombopenia but this condition was absent in the cases resembling Basedow's disease. In 1 case the blood platelets were increased five days

after the operation. The red cells, however, remained normal. The hæmoglobin was found to be increased in true Basedow's disease, but after repeated examinations fluctuated considerably. The color index was normal. The total leucocyte count was normal in 74 per cent of the cases, but in some showed marked deviations.

In most serious cases Kocher has found a leucopenia and in the various forms of goiter mentioned the author found great discrepancies in the number of neutrophiles, especially a neutrophilic leucopenia. The eosinophiles, however, were normal in number. In Basedow's disease there was a decrease in the mast cells in one-third of the cases. The large mononuclears and transitionals were increased in 26 per cent of the cases, but these abnormalities were not noted in the other forms of the disease. Considering 40 per cent as a normal count for the small lymphocytes, the count was normal in about half of the cases. In the other half it fluctuated between a lymphocytosis and a leucopenia. In between 11 and 12 per cent of the cases of true Basedow's disease a basophilic staining of the reds was noted. This never occurred in the cases of struma. In 50 per cent of the cases of struma and hyperthyroidism polychromatosis was present. In the author's opinion this was due to the toxic effect of the secretion of the thyroid on the bone marrow. In 1 case of adiposity in which thyroid extract caused a reduction in weight basophilic red cells were found. In another case of acute strumitis these cells were associated with polychromatosis. The author therefore concludes that Kocher's blood picture is atypical.

The influence of exophthalmic goiter or iodine treatment on the blood picture is not discussed in this article.

KOCHER (Z).

**Milone, C.: The Value of Surgical Intervention in Certain Cases of Hypochondriasis** (Sull'utilità dell'intervento chirurgico in alcuni casi di delirio ipocondrico). *Riforma med.*, 1920, xxxvi, 562.

Following a review of the literature regarding surgical operations, real and simulated, in cases of hypochondriasis the author reports three cases, two of which he treated himself. These patients imagined themselves suffering from grave abdominal affections for which they sought surgical relief. In one case examination revealed nothing abnormal but a small left dorsal lipoma. This was removed under anesthesia and the patient made an excellent physical and mental recovery. In another case operation revealed only a very slight catarrhal endometritis which was entirely out of proportion to the symptoms of which complaint was made. In the third case the patient believed that there were living bodies within the abdomen but operation demonstrated only a slight inguinal hernia. In both the second and third cases operation gave immediate relief but the aberration returned and one of the patients committed suicide.



The author concludes that in most cases a surgical operation seems to be of no value as regards the hypochondriasis and therefore is indicated only by an evident and serious operable physical lesion. In cases of peripheral lesions which do not threaten the general condition or cause grave local disturbances the surgeon should carefully weigh the risks of the operation and its probable results before deciding to perform it. In many cases an operation or the mere anticipation of an operation has caused psychic trauma and serious mental disturbance.

WILLIAM A. BRENNAN.

### BLOOD

**Ives, R. F.: Functional Blood Pressure.** *Am. J. M. Sc.*, 1920, clx, 61.

Ives divides the subject into two parts, considering first functional hypertensive blood pressure, and second, functional hypotensive blood pressure.

Functional hypertensive blood pressure may be influenced by the time of day, the mental attitude, the type of diet, or emotion. However, anything that disturbs the physiological harmony of the circulatory system will naturally influence the mechanical agencies of its flow and cause a change in tension. When the recorded pressure is classed as a symptom rather than as a disease it is of great diagnostic value and aids in differentiating between organic and functional lesions.

The chief etiological factors of hypertension are mentioned and the main factor, metabolism, and its resultant feature, auto-intoxication, are discussed in detail. The views of several authors are quoted.

Mention is made also of the climacteric hypertension, a type of high blood pressure frequently found in women at the menopause. In these cases hypertension develops during or subsequent to ovulation and ovarian glandular secretion, processes with which it is apparently closely associated.

The significance of functional high blood pressure in obstetrics, particularly in connection with the probable occurrence of the eclamptic state, is pointed out. Ives believes that a pressure of over 150 mm. Hg. in patients whose original normal pressure is about 120 is dangerous and that in such cases the patient should be carefully watched and appropriate eliminative measures should be instituted. If the pressure continues to rise, the induction of premature labor should be considered.

In discussing hypertension in cerebral hæmorrhage Ives states that in apoplexy the cerebral hæmorrhage causes a more marked functional rise than the organic causative factor.

In typhoid fever a sharp rise in the blood pressure with abdominal pain suggests perforation of the intestinal wall.

Hypertension is usually associated with cerebral growths, the rising pressure being evidenced functionally by headache and vomiting. When the growth is removed, the tension is lowered.

In considering functional hypotensive blood pressure it is essential to remember that a low arterial pressure is abnormal. The author believes, furthermore, that a hypotensive pressure must be considered functionally pathologic when it is joined with signs and symptoms of impaired health.

Cases of hypotensive pressure may be divided into the following groups:

1. Hypotension due to tuberculosis.
2. Hypotension due to endocrine deficiency: (1) toxæmic, and (2) pituitary.
3. Hypotension due to infections.
4. Hypotension due to shock, hæmorrhage, vomiting, and diarrhoea.

In tuberculosis the low readings are due to the fact that the vitality of the whole organism is affected. In the author's opinion it is well to suspect the presence of tuberculosis, active or latent, in young men and young women between the ages of 16 and 26 who show wasting and anæmia associated with hypotension.

In certain cases it has been demonstrated that glandular substances influence low blood pressure. Great effort should be made, therefore, to determine in what class of cases glandular therapy is effective.

Another factor causing a decrease in the blood pressure is the profound depression which occurs in diseases such as influenza, pneumonia, diphtheria, and typhoid fever.

A. R. HOLLENDER.

**Furness, W. H., and Lee, W. E.: Blood Transfusion.** *Pennsylvania M. J.*, 1920, xxiii, 577.

☞ The essential difficulty in blood transfusion is the element of coagulation. In 1914 the use of sodium citrate was suggested to overcome this danger and it was found that a 0.2 per cent solution would preserve blood for hours and was so slightly toxic to the human tissues that it could be used with impunity. Later it was claimed that whole blood gave more satisfactory results than citrated blood but this question is still unsettled.

Citrated blood gives a febrile reaction in 60 per cent of cases. Moreover, Drinker and Brittingham claim that it cannot prevent the changes in the platelets which initiate coagulation and that it induces slight abnormality in the blood cells as evidenced by increased fragility and a tendency toward hæmolysis. In blood disease, therefore, whole blood is preferable. When in cases of hæmorrhage large quantities of blood are needed, however, the citrate method will usually be found more satisfactory.

The authors are experimenting with a simple method for the indirect transfusion of whole blood in which the contact walls of the intermediate system are coated with a citrate paraffin mixture. By this method they hope to avoid the necessity of introducing large quantities of citrate into the veins of the recipient.

Transfusion is the optimum procedure in hæmorrhage as it is a biological process. The donor's blood cells have been demonstrated in the recipient's blood thirty days after transfusion.

In cases of hæmorrhage due to an injury it is necessary first to control the bleeding point. The author then gives not more than 500 ccm. of blood, which amount he repeats later..

Transfusion yields favorable results in cases of gastric ulcer. If the blood pressure falls below 100 the blood should be transfused slowly. Not over 400 ccm. should be given.

If in postoperative bleeding the bleeding point is not accessible, the transfusion should be begun before anæsthesia is induced. After from 100 to 150 ccm. have been given it should be stopped until the bleeding point has been controlled, when from 350 to 400 ccm. more should be transfused.

Postpartum hæmorrhage and ruptured extra-uterine pregnancy are sometimes indications for transfusion.

Transfusion is indicated before operation in anæmia due to bleeding fibroids and malignancy, and following operation in the anæmia of convalescence.

Primary pernicious anæmia is relieved but not cured by splenectomy.

While it cannot be said positively whether or not transfusion is indicated in all hæmorrhage conditions the author believes it is beneficial and is indicated in infections, intoxications, and debilitated conditions such as hæmophilia.

If a subcutaneous injection of from 15 to 20 ccm. of whole blood does not control bleeding in melena neonatorum, an injection of from 35 to 125 ccm. is a specific.

Purpura is arrested more frequently by transfusion than by any other method, while leukæmia is only temporarily controlled by it.

The dangers of transfusion are:

1. Over-distention of the heart. This is an ever-present danger and is due usually to too rapid administration of the blood. It is evidenced by nausea, blueness of the lips, a cold, clammy skin, shortness of breath, irregular pulse, and vomiting.

2. Embolism. This danger is almost negligible.

3. The transmission of syphilis. A Wassermann test should be made in every case.

4. Hæmolysis and agglutination. All human bloods fall into four groups. Those in the same group do not hæmolyze nor agglutinate each other. Transfusion should always be preceded by agglutination tests.

MARCUS H. HOBART.

#### BLOOD AND LYMPH VESSELS

**Costantini, H.:** The Treatment of Wounds of the Important Vascular Trunks of the Neck, the Axilla, and the Supracardiac Mediastinum (Traitement des plaies des gros troncs vasculaires du cou, de l'aisselle et du mediastin sus-cardiaque). *J. de chir.*, 1920, xvi, 150.

The treatment of war wounds of the great vascular trunks has contributed much that is new to the practice of surgical therapeutics. One fact which is now admitted is that to treat a wound of an impor-

tant vessel it is necessary to make very large openings and long incisions.

Costantini discusses only fresh vascular wounds. Injuries of the neck may occur in the central or thyrohyoid portion, in the lower or supraclavicular portion, or in the upper portion. In wounds of the first type the incision is made along the anterior border of the sternocleidomastoid muscle and, if necessary, is prolonged to the sternum. By means of such an incision Costantini has been able to place two ligatures on the primary carotid and a ligature on the facial within the digastric. In supraclavicular injuries an incision parallel to the clavicle may suffice or may be made to supplement an incision along the anterior or posterior border of the sternocleidomastoid muscle or both, the incision along the posterior edge being an incision of choice. When the lesions are situated beneath a plane passing through the upper edge of the clavicle it may be necessary to section or disarticulate the clavicle and in some cases to section the first rib and a corner of the manubrium in addition, according to the difficulty of locating the injury.

For a discussion of the treatment of injuries in the upper portion of the neck, Costantini refers to his article in the *Presse médicale* for January, 1918.

Axillary wounds are divided into those of the subclavicular region and those of the axillary fossa. In the treatment of the former a long incision is made beneath the clavicle from the deltoid-pectoral space to the internal end of the bone, the pectoral muscles are sectioned, and the subclavicular muscle is split. Transverse incisions at the ends of the long incision may also be necessary. In cases of wounds in the axillary fossa the classical incision for ligation of the axillary artery in the axillary fossa will usually suffice.

Vascular wounds of the supracardiac mediastinum are rare. In such cases Costantini follows the technique used in approaching the heart region which has been described by Duval and Barnsby: (1) a median incision from the cricoid to the fourth costal cartilage; (2) separation by median incision and retraction of the subhyoid muscles as far as the trachea; (3) insertion of the index finger above the sternal fourchette and freeing of the pleura on both sides; and (4) section of the sternum on the median line, transverse section of the sternum on each side, and opening of the space with Tuffier separators.

W. A. BRENNAN.

**Prusík, B. K.:** Injuries to Blood Vessels and Their Influence on the Peripheral Circulation. III. (Gefaessverletzungen und ihr Einfluss auf den peripheren Blutkreislauf. III). *Časopis lek. česk.*, 1920, lix, 269, 345.

Blood pressure measurements and pulse tracings (Erlanger) made before and after operations in many cases of aneurism revealed the following facts:

Venous aneurisms do not influence either the circulation of the injured extremity or the general circulation. Arteriovenous aneurisms which are not



operated upon do not influence the blood supply of the injured limb or the character of the pulse curve. Aneurisms of large vessels, however, result in increased blood pressure and consequent compensatory activity of the heart and larger vessels. The ligation of the artery and vein causes a decided disturbance of the circulation in the injured extremity, the severity of which depends upon the location of the ligated vessels. The more peripheral the ligation, the less severe the damage and the more readily a collateral circulation is established.

In 60 per cent of such operations the pulse is not palpable, the blood pressure falls to a minimum in the affected limb (to as much as 90 mm. Hg. less than on the normal side), and the pulse is either not palpable at all or very feeble. The pulse curve has a typical appearance: a slow rise during systole, then a plateau, and then a slow decline during diastole without diastolic elevation.

In the other 40 per cent of the cases the pulse is palpable but the blood pressure remains about 15 mm. Hg. lower. The destruction of large vessels also influences the blood pressure and causes increased activity of the heart and large vessels.

In 1 case an artery was sutured with good results. The blood pressure fell only about 20 mm. Hg. and the pulse wave was only one-fourth less in height than the wave on the sound side.

KINDL (Z).

#### SURGICAL DIAGNOSIS, PATHOLOGY, AND THERAPEUTICS

Mellon, R. R.: Life Cycles of the Bacteria and Their Possible Relation to Pathology. *Am. J. M. Sc.*, 1920, clix, 874.

The author reviews the more significant studies made of this subject and suggests their possible bearing on some of the unsolved problems of present-day pathology and bacteriology.

Hort showed that in meningitis the cerebrospinal fluid contains a filterable virus which in the fresh state will initiate a continuous fever in monkeys if it does not cause death. Inoculation of this filtrate will then yield the meningococcus in addition to other forms of bacteria encountered in meningitis. These results according to the author, suggest that the virus and the meningococcus are phases in the life cycle of one organism. He has shown that certain members of the colon-typhoid-dysentery group reproduce themselves in other ways than by simple binary fission and that in some cases the life cycle includes an invisible phase.

According to Loehnis, all bacteria alternate from an organized to an amorphous stage. From this stage "regenerative units" develop. These, increasing in size, become "regenerative bodies" which later develop into cells of normal shape. Ferran concluded that the life history of the tubercle bacillus includes three distinct stages: first, the alpha bacillus which is non-acid-fast; second, the non-acid-fast Gram-positive granules of Much;

and third, the tubercle bacillus. Mellon studied the so-called Hodgkin's bacillus and related diphtheroid strains and found in them remarkable morphological and biological changes. In some he discovered long filamentous forms and in others a single large giant coccus. In a case of streptothricosis a filterable form found in the blood on cultivation grew as a diplococcus and later changed to the filamentous or branching form. These separate entities Mellon regards as stages in the life history of a single organism. Browne has recently described a chromogenic spirillum that under altered conditions lived and reproduced itself as a coccoid.

The striking remissions of pernicious anemia, the Pel-Ebstein febrile syndrome in Hodgkin's disease, and other similar changes might well be correlated with alternate "resting stages" and stages of activity in the life history of the organisms involved.

If it is true that there are stages of bacterial life the term "secondary invader" must be reevaluated as the organism to which it is applied may be merely the primary bacterium in a different stage of its life history.

M. H. KAHN.

#### EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

Underhill, F. P., Honeij, J. A., and Bogert, L. J.: Studies on Calcium and Magnesium Metabolism in Disease. II. Calcium and Magnesium Metabolism in Multiple Cartilaginous Exostosis. *J. Exper. M.*, 1920, xxxii, 65.

In a previous paper the authors showed that in leprosy calcium is retained to a marked extent. Magnesium was also retained but not to the same degree. In this article observations upon two selected cases of multiple exostoses are presented. The authors describe their patients and append a long series of tables giving the results of their investigations which they summarize as follows:

In the stabilized stage of exostosis the calcium exchange differed little from that of normal individuals whether the abnormal subject was maintained upon a diet poor or rich in calcium.

In the progressive stage of the disease the calcium metabolism was markedly different from the normal in that calcium was lost from the body in large amounts when the subject was maintained upon a calcium-poor diet. This excessive elimination of calcium occurred by way of both the urine and feces in a normal ratio. When the subject was placed upon a diet rich in calcium, the calcium was retained to an extent not widely deviating from that in normal subjects, but when he was again placed upon a calcium-poor diet the calcium was again eliminated in excessive amounts.

In the stabilized stage of exostosis magnesium excretion was two or three times greater than the intake whether the subject was maintained upon a diet poor or rich in magnesium.

In the progressive stage of the disease the general type of magnesium excretion resembled that of the

stabilized stage but the degree of elimination was not so marked.

Magnesium added to the diet in the stabilized stage was promptly excreted. The same test applied to the progressive stage gave evidence of some retention. The degree of retention, however, was much less than that shown by normal individuals.

The absorption of both calcium and magnesium in exostosis was not inferior to the normal.

The facts enumerated suggest that in the early stages of exostosis, that is, during the proliferative cartilaginous changes, the progress of the disease was sometimes checked by proper diet, i.e., restriction of the calcium and magnesium intake.

GEORGE E. BEILBY.

**Barcroft, J., and others: Discussion on the Therapeutic Use of Oxygen.** *Proc. Roy. Soc. Med.*, Lond., 1920, xiii, Sect. Therap. and Pharmacol., 59.

In the treatment of gas poisoning, oxygen administered by a Haldane face mask, a Stokes intranasal tube, or an oxygen chamber gives excellent results as is evidenced by the disappearance of the clinical symptoms and by the ordinary exercise tests.

The chief symptoms are nocturnal dyspnoea, with or without sleeplessness, and physical distress out of proportion to the exercise causing the dyspnoea.

Barcroft used the oxygen chamber and obtained a marked amelioration of the symptoms immediately after treatment; when the treatment was long-continued, the cases were often cured. The increase in pulse rate after exercise became almost normal, and the return to the normal rate occurred in the usual length of time.

Barcroft found an erythraemia in patients suffering with gas poisoning. After treatment the erythrocyte count was normal.

Of 12 cases reported by Hunt, 8 were considerably improved, 3 were slightly improved, and 1 unimproved.

Haldane states that a small degree of anoxaemia—deficiency of free oxygen in the blood—has serious results and that such an anoxaemia is common. Both theoretically and practically the best method of supplying the oxygen deficiency is the administration of oxygen. The earlier the oxygen is administered, the greater the chance for recovery, especially if pulmonary oedema has developed.

Cummins, Douglas, Ryle, Peters, Shufflebotham, Sowry, and Hamill have all obtained similar results with this treatment.

SAMUEL KAHN.

**Mann, F. C.: Anaesthesia in Experimental Surgery.** *Am. J. Surg.*, 1920, xxxiv, Anas. Supp., 73.

Local anaesthetics may be used in experimental surgery as in surgery on man. The general anaesthetics such as chloroform, nitrous oxide-oxygen, and ether are preferred, especially the latter. The technique usually employed by the author is the induction of the anaesthesia in a closed cabinet fol-

lowed by intubation and the maintenance of the anaesthesia by attaching a single ether can to the intratracheal tube.

The dog is the best animal for general laboratory use. Guinea pigs and rabbits are anaesthetized best by the open method. Goats should be given a preliminary dose of morphine  $\frac{1}{4}$  gr. and atropin  $\frac{1}{50}$  gr. The animal's head should be placed in a position which will allow drainage of the excessive mucus.

**MacNider, W. D.: A Study of Anurias Occurring in Normal Animals during the Use of the General Anaesthetics.** *J. Pharmacol. & Exper. Therap.*, 1920, xv, 249.

Anuria developing in etherized animals occurred late in the course of the author's experiments and was associated with a fall in the systemic blood pressure or a disturbance in the alkali reserve of the blood. When the blood pressure decreased but there was no depletion of the alkali reserve of the blood the use of diuretic solutions resulted in a re-establishment of the flow of urine. When a depletion in the alkali reserve of the blood occurred synchronously with the anuria, the use of diuretic solutions was of no value in re-establishing the flow of urine.

In the animals anaesthetized with chloroform or Grehan's anaesthetic a fall in the blood pressure was observed earlier in the experiments, the flow of urine was more decidedly reduced, and anuria developed earlier in the course of the anaesthesia than in those anaesthetized with ether. Anuria induced in this way may or may not be associated with a fall in blood pressure, but is always associated with a marked depletion in the alkali reserve of the blood.

On the basis of these experiments the author concludes that in order to prevent anuria characterized by a marked reduction in the alkali reserve of the blood but not influenced by the use of diuretic solutions the animals should be given some alkali before a general anaesthetic is used. SAMUEL KAHN.

**Dederer, C.: Successful Experimental Homotransplantation of the Kidney and the Ovary.** *Surg., Gynec. & Obst.*, 1920, xxxi, 45.

Dederer transplanted the left kidney and ovary from one puppy to the neck of another of the same litter. Circulation was continuous except for forty-two minutes during which time the organs were left exposed in the field of operation.

A homotransplanted kidney passed the same functional tests during twenty-six days as normal kidneys.

In dogs of the same litter a homotransplanted kidney and ovary lived for twenty-six days. Pathologic examination showed that the organs reacted to a severe constitutional infection, distemper, in a manner similar to that in which the animal's own organs reacted.

Phenolsulphonephthalein injected into the external saphenous vein began to be excreted from the



homotransplanted kidney in two minutes and forty seconds.

In making a homotransplantation of the kidney it is possible to get a satisfactory arterial anastomosis by suture when the renal artery is less than 1 mm. in diameter.

HOWARD A. MCKNIGHT.

**Marine, D., and Manley, O. T.: Homeotransplantation and Autotransplantation of the Spleen in Rabbits. III. Further Data on Growth, Permanence, Effect of Age, and Partial or Complete Removal of the Spleen. *J. Exper. M.*, 1920, xxxii, 113.**

The authors have been unable to find any references in the literature to the transplantation of fragments of spleen to parts of the body widely separated from the normal neurovascular field of this organ other than those referred to by them in 1917. At that time they reviewed the literature and reported their first experiments with spleen homeografts and autografts in 15 rabbits. In this article they give the data of further experiments with homeografts and autografts and report certain general physiological reactions relative to the spleen which this study has emphasized. The results of these investigations are summarized briefly as follows:

No instance of the survival of spleen homeografts for more than one or two weeks was observed, although the possible advantages of consanguinity, age, and splenectomy were fully utilized. This was in sharp contrast to thyroid, sex gland, and adrenal cortex homeografts, 10 per cent of which survived for a period of thirty days. It suggested that the spleen is a stronger antigen and excites a greater degree of immunity more quickly.

Autografts as a rule survived and grew, failures being due to technical errors. Age was an important factor in the growth of autografts. The younger the rabbit the more rapid the growth. After sexual maturity, however, age became a negligible factor.

Removal of the spleen was a powerful stimulus to the growth of transplants. The effect varied inversely with the age of the animal and usually was negligible after sexual maturity. The influence of age and splenectomy suggested that the spleen is most important in early life and after sexual maturity is either unimportant or its functions are readily assumed by other tissues (hæmatopoietic). Anatomically the spleen is a highly complex structure, but biologically all its major elements are simple as is indicated by their uniform and marked regenerative capacity.

A tendency for grafts to involute or atrophy with age was noted, and some of the grafts made into old rabbits without removal of the spleen underwent complete atrophy. Grafts made in young splenectomized rabbits were observed for more than three years and were considered permanent. There was some evidence that subcutaneous autografts reacted to infections in the same way as the intact spleen.

GEORGE E. BEILBY.

**Brown, W. H., and Pearce, L.: Experimental Syphilis in the Rabbit. III. Local Dissemination, Local Recurrence, and Involvement of the Regional Lymphatics. *J. Exper. M.*, 1920, xxxi, 749.**

From a study of the phenomena of the primary infection, on the one hand, and the phenomena of local spread or dissemination, on the other, it was seen that a multiplicity of lesions developed in the testicle and scrotum of the rabbit which had much the same characteristics irrespective of their origin. Some of these lesions were clearly recognizable as primary lesions or parts of a primary reaction to infection, while others were just as clearly the results of dissemination of the virus from a primary focus of infection.

The effort to draw a sharp line of distinction between these two groups of lesions or between a primary and a secondary stage of infection in the rabbit, however, was largely an arbitrary procedure. The fact was that the tissues of the scrotum and testicle of the rabbit constituted favorable surroundings for the localization and development of pallidum infections. Under ordinary circumstances a large part of the reaction to infection which expressed itself in the formation of lesions recognizable by ordinary methods of examination took place in these tissues. These lesions presented certain broad and general characteristics without regard to whether they were primary or secondary in origin; the reaction was merely a reaction to a syphilitic infection which in either case might assume the most diverse character.

Further, it appeared that in rabbits infected with such strains of *treponema pallidum* as the authors used the virus was never confined to the area occupied by the so-called primary lesion, or chancre, but always spread and gave rise to a regional adenopathy. There were no lesions to indicate the progress of this dissemination, but an examination of the inguinal nodes showed that dissemination occurred very soon after inoculation, and a pallidum reaction was detected in these glands even before infection was recognized in the scrotum.

Subsequently lesions developed in all parts of the scrotum and testicle, sometimes involving the entire testicle or scrotum, and at others forming localized lesions with a special predilection for certain locations such as the epididymis, the mediastinum testis, the tunics, and the dorsal folds of the scrotum. In some instances more or less continuous lesions formed along the course of the perivascular lymphatics, suggesting that this was one path taken in the dissemination of the organism.

It was probable, however, that lesions of a gross character developed more as a result of the accumulation of spirochætes than as the result of mere invasion of the lymphatics since they were not a constant accompaniment of the local infection, while invasion of the lymphatics and extension of the infection to the regional lymph nodes occurred in all cases.

GEORGE E. BEILBY.



## ROENTGENOLOGY AND RADIUM THERAPY

Shearer, J. S.: *The Physics of the Roentgen Ray.*  
*Arch. Dermat. & Syph.*, 1920, n. s. i, 664.

Roentgen rays are electromagnetic waves due to electromagnetic action originating in a disturbance of the electrical components of atoms. Their vibration frequencies are greater and their wave lengths much shorter than those of ordinary light, but their velocity of propagation and origin are the same. In their production the electrons are separated from matter: (1) by breaking down gas molecules in a vacuum tube, and (2) by shaking them from the atoms of a very hot metal. The first method was that of the older type of gas tube; the second, that used in the Coolidge tube.

The condition necessary to produce rays is a sudden changing of the velocity of the electrons, i.e., starting or stopping. In the operation of a roentgen-ray tube electrons in enormous numbers are separated from atoms and by reason of their electric charges are given great speed. The roentgen rays are produced when they strike the hard metallic surface of the anode or target. For a target of given material only two operating factors need concern the therapist. The nature and the quantity of radiation is absolutely fixed by the number of electrons used per second and their striking speed. A properly calibrated millimeter tells the relative number of electrons, and the electrical difficulty of driving them through the tube indicates their speed. The latter is indicated by the length of spark the electrical discharge will cross in the air with the same amount of current needed to pass through the tube.

As a measure of the quantity and quality of the rays, the following effects produced by them have been used as a measure: (1) the photographic effect; (2) color change in certain chemicals; (3) separation of electrons from atoms (ionization, photo-electrical action, etc.), and (4) heat produced during absorption. In order to study the rays accurately, those of different wave lengths must be sorted out. This can be done by passing them through certain crystals. Such analysis of the roentgen-ray output of a tube has been made at various operating voltages. Three important facts are evident from this study: (1) the energy of all wave lengths in any low voltage curve is much increased when the voltage is raised; (2) raising the voltage adds short waves not present at lower voltages, and (3) the wave length for which the energy is a maximum is shorter at the higher voltages. Hence it follows that the quality of the rays is different when the tube is operated at different voltages. When the current and voltage of the operation of a roentgen-ray tube are reproduced, both the quantity of radiation per second and its quality are also reproduced.

The action of every wave length and of all waves on a receiving body decreases for a given receiving area as the square of the distance increases. This

has an important practical bearing as the exposure time must be increased inversely as the square of the distance is increased if the same effect is to be produced.

The intensity of the rays is reduced when they pass into or through various materials. The term "absorption" is used to denote such a reduction. One of the most striking characteristics of roentgen rays is their penetrating power, i.e., their relatively slight absorption by many substances highly opaque to light. Absorption depends on the material traversed and for a given material is dependent on the wave lengths received. For a single wave length the known facts as to absorption are: (1) when the rays pass through a given thickness of material their intensity is reduced nearly in proportion to the physical density of the material; (2) if at the first surface of a layer of thickness,  $t$ , the intensity is  $Q_1$ , and at the distal surface is  $Q_2$ , then the quantity  $Q_1$  minus  $Q_2$  divided by  $Q_1$  represents the percentage absorbed in the layer; (3) the next layer of like thickness will absorb the same fraction of what its proximal surface receives, and this will be true for each layer in succession. The higher the rate of absorption of the material for the wave length considered, the more the first layers absorb and the greater the difference between the absorption in the first millimeter and the absorption in any given millimeter below the first. The actual output of the tube always contains a great variety of wave lengths. Each wave length has its own rate of absorption, but the rate is always less for short than for long waves. It has been definitely ascertained that: (1) the total radiation from a tube operated at low voltage is less than from a tube operated at the same current at high voltage; (2) the energy from the low voltage tube is more easily absorbed; and (3) the absorption in the first layers is much greater at low voltage than at high.

The data relative to absorption has an important bearing on the therapeutic application of the roentgen rays. As their biological action is due to that part of the radiation actually absorbed, and as the general distribution of absorbed radiation in successive layers for a given wave length is similar for all substances, the only difference being in the thickness of the layer required to absorb a specific percentage, the amount of radiation applied to any tissue may be ascertained with a fair degree of accuracy.

The term "filter" has been applied to any material used between the tube and the patient's skin. The purpose of the filter is to remove a large part of the radiation that would otherwise be absorbed by the superficial layers of flesh. Filters are necessary and important for the treatment of non-superficial lesions, but in the judgment of the author are of little demonstrated value in the therapy of superficial lesions.

The term "secondary rays" has been used to specify at least three different rays, viz.:



1. Roentgen rays coming from parts of the tube other than the focal spot. These may be better designated as "parasitic rays."

2. Reflection of the roentgen rays. Atoms of matter reflect roentgen rays slightly just as particles of dust or mist reflect light. Such reflection results in a slight diffuse scattering of the initial beam without other change.

3. New beams formed when roentgen rays of sufficiently short wave length (due to proper high voltage operation) strike certain atoms. These are true characteristic secondary rays. The quality of such new beams depends on the atomic weight of the affected atoms. In some cases such beams are of interest to the therapist.

If thin metal filters are close to the skin and receive roentgen rays of short wave length in sufficient quantity the characteristic easily absorbed long-wave-length radiation may injure the skin. It may give undesired results also when metallic ointments or medication are present in the patient's tissues.

The general facts stated in the article are summarized thus:

1. The electrical conditions of operation fix absolutely the radiation delivered per second by a given target; hence adequate control of these conditions will make possible complete duplication of radiation as regards both amount and quality.

2. The two factors to be borne in mind are: (1) spark gap or tube voltage; (2) current in milliamperes. Of these, the former is by far the more important.

3. The amount of radiation received by a given layer of tissue when the tube is operated for a definite time under prescribed electrical conditions depends on: (1) the distance from the target; (2) the nature and thickness of all material through which the rays passed before they reached the tissue treated.

4. The reaction of living tissue to the roentgen rays is due to the rays absorbed.

5. There is no evidence at present that the biological effect of radiation depends on the particular wave lengths absorbed.

6. The biological effect doubtless depends not only on the total amount absorbed, but also to some extent on the rate of absorption; in other words, on the frequency of treatment as well as on the quantity of radiation.

7. Layers of tissue near the surface of entrance always receive and absorb more radiation than the deeper layers.

8. The inequality of absorption between the deep and surface layers due to the decrease of the intensity with the distance is reduced when the distance of the tube from the skin is increased.

9. The inequality of dose between the different layers is reduced by the use of filters.

10. This inequality is reduced also when a moderately high voltage is employed.

ADOLPH HARTUNG.

**Cameron, D. F.: A Comparative Study of Sodium Iodide as an Opaque Medium in Pyelography.**  
*Arch. Surg.*, 1920, i, 184.

This article gives the results of a comparative experimental study of the properties of the substances commonly used in pyelography, together with the clinical results obtained with sodium iodide. Solutions of sodium bromide and neutral citrate of thorium nitrate were compared with a solution of sodium iodide as to their opacity to roentgen rays, toxicity, osmotic pressure, degree of irritant action, and viscosity. The results and conclusions are summarized as follows:

1. The investigation of the comparative opacity of several pyelographic mediums shows that the molar, or 13.5 per cent, solution of sodium iodide is fully as opaque as the 3 molar, or 25.2 per cent, solution of sodium bromide and definitely more opaque than the standard neutral thorium solution which is correctly designated as a  $\frac{5}{6}$  molar thorium nitrate solution, but commonly called the "15 per cent" solution.

2. The kidney function as determined by the usual blood, urea, nitrogen, and creatinin determinations and phenolsulphonaphthalein tests, both in the dog and in man, is not changed by the introduction of the molar and  $\frac{4}{3}$  molar solutions of sodium iodide into the kidney pelvis even when, experimentally, the latter is kept distended by the solutions at the secretory pressure of the kidney for twenty-five minutes. The same results are obtained also with the 3 molar sodium bromide solution.

3. When given intravenously to dogs, the 25 per cent solution of sodium iodide, as well as the 25 per cent sodium bromide solution, produces no apparent immediate toxic effect. The blood pressure and respiration have remained unaffected when 50 ccm. of each of these solutions have been injected intravenously into a 30-lb. dog within a period of ten minutes. The 13.5 per cent sodium iodide solution, however, is the solution used for pyelography. Solutions of potassium salts, whether bromide or iodide, are very toxic when given intravenously.

4. The comparatively rapid absorption of different substances from the kidney pelvis, as observed by Burns and Weld, is confirmed by the fact that the contents of the kidney pelvis of a dog fail to respond to the usual tests for iodide from one and a half to two hours after the pelvis has been filled with a molar or  $\frac{4}{3}$  molar sodium iodide solution which was retained in the pelvis by occluding the ureter.

5. The sensory stimulation or irritation of the kidney pelvis produced by the three different mediums investigated is probably very slight, but marked differences are obvious when tested on the tongue, the thorium solution causing the least stimulation and the 25 per cent bromide the greatest.

6. The viscosity of distilled water, the molar sodium iodide, the 3 molar sodium bromide, and the standard thorium solutions, as determined by

the ordinary viscometer, is represented by the figures 28, 29, 31.5, and 50, respectively. A low viscosity is a very important property for a good pyelographic medium since the quantity of the medium which can be introduced into the kidney pelvis, other things being equal, varies inversely with the viscosity.

7. The osmotic pressure of an average concentrated urine, the molar sodium iodide, the 3 molar sodium bromide and the standard thorium solution is represented by the figures 2.7, 3.78, 13.47, and 5.52, respectively. From this it is evident that the iodide solution is the least hypertonic of the three mediums. In this respect it is far nearer the ideal than the bromide solution which has over three times as great an osmotic pressure, for it is well known that, other things being constant, the injury produced by hypertonic solutions on living tissues increases with the hypertonicity.

8. For clinical use twenty-two pyelograms were made, solutions of sodium iodide varying in strength from 20 to 13.5 per cent being used. No serious reactions whatever were noted. The number of patients who had more or less distress as a result of the pyelography and the number who suffered no additional discomfort whatever were equal. The discomfort was caused by over-distention of the kidney pelvis.

9. These recent experiments have modified previous conclusions in two respects: first, in the article published by the author in collaboration with Grandy sufficient emphasis was not placed on the fact that the sodium iodide solution was preferable to the potassium, for it has been shown that the potassium salt is somewhat irritating and, because of its toxicity when given intravenously, it does not afford so great a factor of safety in the event of its absorption in large amounts; second, increasing experience has demonstrated that instead of the 25 per cent solution of sodium iodide originally recommended, a molar or 13.5 per cent solution is sufficiently opaque for all pyelographic work and in this respect, at least, equals and, if penetrating rays are used, surpasses the 25 per cent bromide and the standard thorium solutions.

10. The molar, or 13.5 per cent, sodium iodide solution now recommended is prepared by dissolving 15 gm. of the salt in a sufficient amount of water to make 100 ccm. In previous articles it has been shown that such a solution is neutral in reaction, mildly saline to the taste, non-irritating, and does not form precipitates with blood or urine.

11. Although the molar sodium iodide solution is not the least expensive of the pyelographic mediums, it nevertheless possesses certain distinct advantages which seem to make it the most suitable. Among these should be emphasized its freedom, as far as can be determined, from toxic effects and irritation; the ease with which it can be prepared, the fact that it has the lowest viscosity and the lowest osmotic pressure of any mediums so far suggested colloids and emulsions alone excepted,

and the fact that it exhibits an opacity to roentgen rays which increases with increasing penetration of the rays, definitely surpassing in this respect the thorium and bromide solutions. ADOLPH HARTUNG.

**Remer, J., and Witherbee, W. D.: The Cause of X-Ray Burns.** *Med. Rec.*, 1920, xcvi, 183.

It was formerly believed that low voltages produced an immense number of rays of low penetration which were absorbed by the skin and hence were more apt to cause a roentgen-ray burn than the high voltages with rays of high penetration which are not absorbed by the skin. In order to test out this theory the experiments reported in the *American Journal of Roentgenology* for June, 1917, were made. These showed that when equal skin unit doses were given the results on the skin were identical even if the spark gap and time of exposure were varied. It was apparent, therefore, that the quality of the rays and the absorption of those of long wave length had little to do with the biological effects in the skin. The facts upon which these effects depended seemed to be solely the quantity of roentgen rays reaching the skin for it is obvious that a high spark gap produces more rays that reach the skin than the same dose with a low spark gap.

Recently the authors made experiments with filtered and unfiltered rays, using 3 mm. of aluminum for the former. An erythema dose was given in each instance, the factors employed being the same with the exception of the time of exposure. Biologically, to all appearances, the erythema produced in thirty-three and three-fourths seconds by the unfiltered ray was the same as that produced in seven minutes, forty-two seconds by the filtered ray. Since the voltage in both cases was the same, it would follow that any change in the quality of the ray determined by voltage could not have been responsible for the longer time needed. The quantity of roentgen rays was materially lessened by the aluminum, thus making the enormous difference in the time of exposure.

ADOLPH HARTUNG.

**Albray, R. A.: Some of the Essentials of Dental Radiography.** *Dental Cosmos*, 1920, lxii, 805.

The author presents some of the important steps and procedures which are essential to obtain roentgenograms of good quality and to make reasonably accurate diagnoses from them. A good equipment and thorough familiarity with it are prime requisites. A wooden arm-chair with a specially constructed head-rest is preferable to the ordinary dental chair as the patient is less apt to receive electric shocks from it and the likelihood of artifacts from secondary rays is eliminated. A thorough and painstaking examination of the part or parts under suspicion should precede the roentgen examination to determine the need for such an examination and what it is desired to show. It may be necessary to produce distortion to bring out the points wanted or to make exposures from different angles. The danger of burns from too long exposures



or exposures too frequently repeated should be borne in mind. As regards the technique, experience is by far the most important factor making for proficiency. Careful attention should be given to the details both in the taking and the developing of films.

The interpretation of radiographic findings calls for much thought, the application of a knowledge of the anatomy and physiology of the parts examined, an understanding of the pathologic changes which may occur in these parts, and intelligent consideration of the case history and clinical findings in their relationship to the radiographic picture. Through the shadows produced by different densities of the tissues or foreign substances the radiograph is a faithful record. The determination of the meaning of these shadows is a task which at times assumes the proportions of a Chinese puzzle. When studied with the clinical findings of the case, some radiographs may be diagnosed almost instantly while others must be carefully inspected with the magnifying glass and several films of the area must be taken from varying angles with different lengths of exposure and tubes of hard and soft quality before a satisfactory diagnosis can be made. When examining a radiograph some of the particular conditions which should be looked for aside from the favorite rarefied area are thickening of the bone about the root apices due to traumatic occlusion, pyorrhœal absorption of the alveolar process, carious cavities in the teeth, secondary caries under fillings or the edges of crowns, pulp stones, exostosis of the roots, fragments of roots of extracted teeth, impacted or unerupted teeth, foreign bodies, and necrotic or cystic areas.

A few of the physiological structures which must not be confused with pathologic conditions are the mental foramen, the inferior dental canal in the mandible, the anterior palatine canal, the antrum, the nasal cavity, and the coronoid process of the mandible. Areas about young teeth just erupting or recently erupted should not be mistaken for abscesses. Teeth which have been undergoing orthodontic manipulation will frequently show what appear to be pathologic lesions in the bone about their root apices.

ADOLPH HARTUNG.

**Newcomet, W.S.: The Treatment of Angiomata with Radium.** *Am. J. Roentgenol.*, 1920, n. s. vii, 337.

Angiomata occur frequently and numerous methods are used to remove them. They are removed usually for cosmetic reasons or because they interfere with the free movement of the adjacent parts.

Radium therapy is the ideal method as it destroys certain cells without destroying the tissue *en masse* as do hot water, caustics, CO<sub>2</sub>, ice, etc. The nævus should be treated as soon as it is discovered as spontaneous enlargement and malignant degeneration may take place at any time. Early treatment of nævi present at birth will allow regeneration of skin which cannot be expected later in life.

For convenience, the author divides these lesions into three groups: (1) hæmangiomata, (2) lymphan-

giomata, and (3) pigmented angiomata. These types blend so that at times the differentiation is difficult. Each type, however, is a distinct entity with a different arrangement of the tissue structure. The small lesions are easily treated and good results are obtained but those which are larger are more difficult to treat. In the extensive lesions the normal tissues are largely replaced by the vascular nævus. Since radium rays cause destruction and obliteration of these vessels without replacement by normal epithelium or epithelial structures, such as hair, down, glandular structures, etc., it is difficult to get an inconspicuous result in such cases. Two cases of lymphangioma were treated, but the outcome was not satisfactory. In cases of pigmented lesions the diagnosis is important as some have proved to be melanotic sarcomata. A history of sudden enlargement of an ordinary mole should be looked upon with suspicion. When a mole has a deeply infiltrated base good results are obtained even if the nævus is covered with hair.

A standard technique is important as the results depend upon the proper amount of irradiation. Too small dosage is preferable to over-dosage with the production of ulceration. When repeated treatments are necessary, it must be borne in mind that subsequently the part will not tolerate the dosage of the first application. The average dose should be a dose which produces erythema, and must be judged according to the applicator used, the filter, and the skin distance. The skin distance is the most important factor and varies directly with the depth of the nævus. The length of exposure is increased with the distance.

In the cases reviewed, flat applicators, tubes of radium and emanation were used at first, but because of the irregular surface of the lesions, the plaques and emanation were discarded and the tubes were used exclusively. Since the skin which adjoins the nævus is usually very sensitive, lead screens were used to protect it and to prevent the breaking down of the healthy skin. In cases in which CO<sub>2</sub>, ice, hot water, iodine, etc., had been used the lesions were treated as if they had been irradiated previously.

As the lesions varied so extensively, no definite dosage was given. In general, from 20 to 140 milligrams were used for from two to four hours at each application, and from 3 to 60 treatments were given.

Some of the complications noted were ulceration, spontaneous local gangrene, and ulceration with the formation of granulation tissue. These did not interfere with the results except that there was more or less scar formation.

The accurate application of the radium is facilitated by making a cast of the lesion and then placing the radium tubes in this cast so that when the cast is reapplied, the radium lies in the desired position against the lesion.

The results in the majority of the cases treated were all that could be desired. In 86 cases selected for radium therapy the treatment was a failure in 7,

17 disappeared from observation, and in the remaining 62 the results were excellent.

In summing up the sequelæ the author mentions keloid formation, telangiectasis, and secondary ulceration in the site of the scar appearing a year or two following the treatment. W. L. BROWN.

### LEGAL MEDICINE

**The Construction of the Statute Making Hospital Records Admissible in Evidence.** *Leonard vs. Boston Elevated Ry. Co. (Mass.) 125 N. E. R., p. 593.*

In Massachusetts, according to the decision in this case, only such portions of hospital records are admissible in evidence as relate to the treatment and the patient's medical history. "The difficulty in applying the act," the court stated, "arises from the nature of the entries made in hospital records. It frequently must happen that facts stated therein, which deal in the main with the patient's medical history, may also be relevant to the issue of liability in the event of litigation. For instance, a statement of the location and nature of the patient's injuries, primarily an essential element in the history and treatment of his case, may incidentally tend to confirm or disprove his claim as to how the accident happened. So the condition of intoxication in the case of a patient suffering from delirium tremens would be an important element of his medical history and treatment; \* \* \* In our opinion a reasonable and practical construction of the statute requires that a record which relates directly and mainly to the treatment and medical history of the patient should be admitted, even though incidentally the facts recorded may have some bearing on the question of liability." JOHN A. CASTAGNINO.

**Hospital Records as Evidence.** *Zipus vs. United Rys. (Md.) 108 Atl. R., p. 884.*

In this case an effort was made to introduce certain hospital records as evidence. The person who made the records was not presented and no one was able to tell by whom they were made, whether a student or a physician in the hospital. It was known only that they appeared among the records in the hospital, together with a large number of others. This evidence to support the hospital records was held to be too indefinite and not sufficiently accurate to warrant its acceptance. JOHN A. CASTAGNINO.

**Effect of Receiving Check "In Full of Account."** *Booth vs. Dougan (Mo.) 217 S. W. R., p. 326.*

The plaintiff, a physician, and the defendant, his patient, had a dispute concerning the physician's bill. The physician rendered a bill which the patient refused to pay. An agreement was finally reached between them and pursuant to that agreement the physician agreed to a reduction. The patient then sent the physician a check marked "In full of account to date." The physician cashed the check, but testified that he did not notice the words on the check at the time he did so. The court held

that, in view of the dispute, the acceptance of a check so marked would prevent the physician from suing the patient for the unpaid balance.

JOHN A. CASTAGNINO.

**Evidence of Causal Connection between Negligence and Injury.** *Eicholz vs. Poe, Missouri Supreme Court, 217 S. W. R., p. 282.*

In this case the plaintiff was a blacksmith who had worked at his trade until the day before he was operated on and apparently was in reasonably good health. Two days after a nephrectomy he informed his physicians that he had a toothache. One of the physicians called his dentist who examined the tooth, applied some lotion which he said would stop the pain, and went away, but returned in the evening, extracted the aching tooth, and broke the jaw in so doing. The patient informed the physicians as well as the dentist that his jaw was broken, and one of the physicians incised the inner side of the jaw. The patient himself removed parts of the bone and called them to the physicians' attention. The court held that under the circumstances the physicians were responsible to the patient for the injuries resulting from the removal of the tooth.

JOHN A. CASTAGNINO.

**Competent Medical Witness and Evidence of Insanity.** *Beasley vs. Faust (Texas) 217 S. W. R., p. 179.*

In this case it was held that a medical witness, not a specialist on mental diseases, but a physician who had treated many insane patients and had read text-books on insanity, was competent to testify as an expert that a person was insane at a time when he had not observed him, his opinion being based on observations of, and conversations with, this person before and after such time. The physician's admission that he was unable to state the type of the insanity, however, was seized upon as an indication that he was not sufficiently skilled in this disease to be an expert witness. The court held that the specialist in diseases of the mind may be able to classify all cases of insanity which come under his observation with reasonable accuracy, but it is not necessary that he should be a specialist in order to testify as a skilled witness. JOHN A. CASTAGNINO.

**Hospitals Liable for Negligence of Employees.** *Mulliner vs. Evangelischer Diakonissinverein (Minn.) 175 N. W. R., p. 699.*

A pneumonia patient suffering from delirium was left alone in a room on the second floor of a hospital. A few minutes later the window was found open and the patient was discovered laying dead on the ground below. The evidence disclosed the fact that the patient had been delirious for some hours and that nurses in attendance were aware of her condition. The hospital was provided with an insufficient number of attendants. The court held that a patient is entitled to such reasonable attention as his safety may require. If the patient is temporarily bereft



of reason and is known by the hospital authorities to be in danger of self-destruction, the authorities are in duty bound to use reasonable care to prevent such an act.

Another question presented in this case was as to the liability of the hospital even if it had been guilty of negligence. This hospital is of the class commonly known as charitable corporations. It was founded and its buildings were erected partly by money donated and partly by money borrowed. It is not maintained for profit, but most of its patients are pay patients, and the receipts from these patients largely exceed the cost of maintaining the hospital. Under these circumstances the hospital is liable. The verdict rendered for \$6,500 was upheld by the Supreme Court of Minnesota.

JOHN A. CASTAGNINO.

**Recovery for Services Not Supported by Evidence.**  
*Huntley vs. Geyer (N. D.) 175 N. W. R., p. 619.*

In this case a physician sued to recover for professional services rendered the son of the defendant who was 24 years of age. The son lived with his father and mother, but operated an adjoining farm for himself. From the evidence it appeared that the son acted solely for himself in employing the physician and that his father and mother had had nothing to do with it. The case was reversed for a new trial inasmuch as the physician should have sued the son rather than the father.

JOHN A. CASTAGNINO.

**May Testify to Making Examination But Not As To Result.** *Livingston vs. Omaha & C. B. St. Ry. Co. (Neb.) 175 N. W. R., p. 662.*

In endeavoring to rebut testimony that the plaintiff was free from venereal disease the defendant in this case desired to prove that the plaintiff called upon and was examined by a physician. The court (Nebraska) held that the physician might testify as to whether the plaintiff called upon and was examined by the physician but he would not be permitted to testify as to the result of the examination.

(The court did not state the reason for this rule, but it arises by virtue of the fact that in many states conversations between physician and patient as well as the results of examinations of the patient's

body constitute confidential communications which are not subject to disclosure even in a lawsuit. However, there are other states which hold that such communications and examinations are not confidential. Illinois is a notable example of the latter.)

JOHN A. CASTAGNINO.

**Cutting Hole in Bladder—Skill and Care Required.**  
*Krinard vs. Westerman (Mo.) 216 S. W. R., p. 938.*

In this case the plaintiff claimed that the defendant, a physician, had represented that he was especially skilled in removing fibroid tumors of the uterus. She thereupon employed him but charged that in the performance of the operation he cut a large hole in the bladder, that he neglected to mend the bladder at once, and that either during or after the operation he so cut or tied off the left ureter that both the left ureter and left kidney entirely lost their function and became atrophied.

The physician admitted that he cut an opening in the patient's bladder, but claimed that it was necessary in order to remove the tumor, and that the cutting was not negligently done. He admitted also that he performed two subsequent operations in an effort to close the opening, but was unsuccessful on account of the fact that the parts were diseased. The testimony, however, seemed to corroborate the patient to the extent that there was no diseased or cancerous condition. Before the operation she had not suffered from kidney trouble. A fair inference from these facts would be that the physician had destroyed the left ureter in one of the operations. According to the court, "the operation he attempted to perform was a delicate one and required skill. He proved not to be equal to the task."

The court instructed the jury that in such a case it was the physician's duty to exercise reasonable skill and care such as an ordinarily skillful and careful surgeon is accustomed to exercise in like surgical operations under like circumstances, but did not limit the degree of skill to be that possessed by reasonably skillful surgeons in the community in which the operation is performed. The reviewing court held this to be a proper instruction to the jury. A judgment of \$15,000 was therefore affirmed.

JOHN A. CASTAGNINO.

# GYNECOLOGY

## UTERUS

**Stevens, T. G.: A Case of Sacculation of a Gravid Bicornate Uterus.** *Proc. Roy. Soc. Med.*, Lond., 1920, xliii, Sect. Obst. and Gynæc., 154.

The patient was admitted to the hospital after having had severe labor pains for two days without any progress in the labor. Although the pain was very great, especially in the back, the uterine contractions did not appear to be very powerful. On examination a full-term foetal head was found to be at the upper part of the uterus. A fluctuating swelling which depressed the posterior fornix filled the upper half of the pelvis, while the os uteri was completely out of reach in front of this mass. As the cervix was above the pubes and could not be reached at all, and as the patient was in great distress, it was determined to perform a caesarean section and then remove the mass in the pelvis. This mass had been diagnosed as an ovarian cyst.

The usual median incision was made in the uterus and the foetus extracted. On delivering the uterus through the abdominal incision it was found that the pelvic swelling was really a sacculation of the uterus itself formed by the greatly distended anterior wall, the actual fundus being held down in the pelvis by a firm adhesion.  $1\frac{1}{2}$  in. broad by  $\frac{1}{8}$  in. thick. A solid projecting mass which was pulled up out of the pelvis was attached to the left side of the expanded uterus and proved to be the enlarged, thickened but not expanded half of a bicornate uterus, one-half of which was about twice as large as the other. The tubes and ovaries were quite normal and there were no other adhesions. The child was in a condition of white asphyxia but recovered after a hot bath and artificial respiration. The mother made an uninterrupted recovery.

CARL B. DAVIS.

**Novak, E.: The Relation of Hyperplasia of the Endometrium To So-Called Functional Uterine Bleeding.** *J. Am. M. Ass.*, 1920, lxxv, 292.

The author discusses the etiology of the hyperplasia of the endometrium and the causes of functional uterine bleeding. The following summary is given:

"1. Functional uterine bleeding occurring in the absence of any gross pelvic disease is very common at the menopause, when it often leads to the suspicion of malignancy. It is next most frequently observed at or near the time of puberty, but it may occur at any age. The bleeding is commonly of the type menorrhagia, with not infrequently periods of amenorrhœa.

"2. A frequent histologic finding in these cases is the condition that has been called hyperplasia of the

endometrium. This is characterized by an overgrowth of both the epithelial and stromal elements of the endometrium with the production of a perfectly distinctive histologic pattern which makes its recognition easy by means of the microscope.

"3. There are good reasons to believe, as I have shown, that hyperplasia is not a primary disease of the endometrium, but that it is secondary to an endocrine disturbance of the ovary. The exact nature of this functional disorder and the precise histologic changes in the ovary which are associated with it have not as yet been satisfactorily determined.

"4. The secondary nature of hyperplasia of the endometrium explains the failure of curettage to bring about permanent cessation of the menorrhagia observed in these cases. This procedure merely attacks a local manifestation of the underlying cause—an endocrine disturbance involving the ovary."

CARL H. DAVIS.

**Frank, L.: Carcinoma in the Cervical Stump after Supravaginal Hysterectomy; and the Radium Treatment of Carcinoma of the Cervix.** *Am. J. Surg.*, 1920, xxxiv, 149.

The author has reviewed the literature to date and collected 47 cases of cancer occurring in the cervical stump after supravaginal hysterectomy, 43 of carcinoma and 4 of sarcoma. He reports also 4 additional cases of carcinoma. In about 40 per cent of the carcinoma cases the interval between the hysterectomy and the diagnosis was so short that it appears probable that the carcinoma was present at the time of the original operation.

The author treated 3 cases with radium and reports an apparent cure at the end of one year in 2 of them. In addition to these results he reports those obtained by radium treatment in 38 cases of carcinoma of the cervix. Eight of the latter would probably have been classed as operable; 30 were clearly inoperable. Of the 38 patients, 6 could not be traced, 11 have died, 4 are not well but are without local evidence of the disease, and 18 are entirely well.

The literature of the radium treatment of carcinoma of the cervix is reviewed. S. A. CHALFANT.

**Hansen, I.: The Treatment of Carcinoma of the Uterus with Radium in Stockholm** (Radium-behandlung des Gebärmutterkrebses in Stockholm). *Ugeskr. f. Læger.*, 1920, lxxxii, 357.

The systematic use of radium in the treatment of carcinoma in gynecological cases dates from 1910. This treatment was initiated and developed by Forsell. In Sweden radiotherapy is practically a monopoly, being given exclusively in the Radium Insti-



tute. This institute has clinical, polyclinical, and X-ray departments. The great advantage of such a monopoly is becoming recognized.

The equipment consists of 0.9 gm. of radium which is divided for surface use and for use in the well-known Dominici tubes. The tubes are from  $\frac{1}{2}$  to 3 cm. long and from  $2\frac{1}{2}$  to 4 mm. thick. They are made of lead, silver, gold, or platinum and contain from 1 to 7 ctg. of radium salt.

In gynecological work the Dominici tubes are used exclusively. They are prepared according to the desired intensity of the rays in flat boxes of 6 to 12 pieces or in somewhat flattened cylinders of 5 pieces. The thickness of the walls of these boxes and cylinders corresponds to a filter of 2 mm. lead, and the total filter strength is 3 mm. of lead, the wall of the tube being equivalent to 1 mm. of lead.

For rectal applications a bent instrument is used which carries before it a metal box into which the Dominici tube is inserted.

The therapeutic principle followed is large doses, short intervals between treatments, hospital observation for long periods, and simultaneous intensive X-ray treatment. The dosage should amount each time to about 200 mg., of which from 60 to 70 mg. should be placed in the uterus and the rest in the vagina. By intra-uterine treatment it is possible to attack a cervical tumor from all sides, reaching at the same time the few cancer nests in the corpus.

Paper, cotton, or rubber may be used as secondary filters. The application must be made very carefully. Forsell emphasizes the importance of protecting the rectal wall with gauze tampons. After the application of the radium absolute rest in bed is necessary. The tube should be removed after about twenty-four hours. The second treatment should be given the following week, and the third treatment one week later.

X-ray treatment given at the same time and continued for a few years is advisable: 30 H over four areas (2 posterior and 2 anterior) and 4 mm. filters of aluminum or 0.5 mm. filters of copper. There is little danger of X-ray burns when careful use is made of metal and secondary filters. The danger of infection is greater as the surrounding tissues are never rendered entirely aseptic. Rectal and vaginal fistulae are rare complications.

Of 66 cases treated in the year 1914-1915, 18 (27.3 per cent) remained cured. Of these 18 cases 14 were inoperable. One case in which recurrence set in after operation was cured by radium treatment. Of the operable cases, 4 (44.4 per cent) were cured. Radiotherapy is therefore not less effective than surgical treatment.

SAXINGER (Z).

#### ADNEXAL AND PERI-UTERINE CONDITIONS

Grant, W. W.: *Femoral Hernia of the Ovary*. *J. Am. M. Ass.*, 1920, lxxv, 289.

Of 36 cases of femoral hernia tabulated by Englich, the hernia was an inguinal hernia in 27 and a femoral hernia in 9. Of 137 cases reported by

Heineck, only 13 were cases of femoral hernia. It is clearly manifest that most femoral herniae are of the inguinal variety (eight times as many as of all others), that such herniae are not common, and that femoral herniae of the crural type are rare. The condition is usually unilateral. The predisposing cause is the persistence of the canal of Nuck occupying the position analogous to that of the processus vaginalis in the male. "It occurs generally after the postpartum period of life." A lax mesentery and stretching and mobility of the broad ligaments by pregnancy are probably contributory causes.

The author reports two cases which may be summarized as follows:

Case 1. A widow, aged 37, the mother of two children, had had a femoral hernia of the left side for three years which had caused little pain except when it protruded, but finally became non-reducible because of mild inflammatory attacks. At operation a small, somewhat atrophied ovary was removed from the sac. The patient made a complete recovery.

Case 2. A widow, aged 56 years, the mother of two children, had been troubled with a femoral hernia of the left side since 1892. About five years before operation she noticed an enlargement or tumor just below the hernia. At operation a normal ovary was found lying just below the femoral ring which greatly constricted the omentum. At the lower end of the omental mass was a follicular ovarian cyst.

The author describes the surgical technique necessary in cases of this type. He advocates the use of non-absorbable suture material as it is of great importance that the reconstructed canals and rings should be strongly supported until the fascial tissues are in a perfect state of repair. CARL H. DAVIS.

Lanza, C., and Pantolini, M.: *The Parovarium and Its Cystic Degeneration* (Parovario y degeneracion quistica del mismo). *Rev. argent. de obst. y ginec.*, 1920, iv, 46.

Lanza and Pantolini report a case of cystic degeneration of the parovarium, the salient features of which were as follows:

The patient was 24 years of age and married. She had had one normal delivery. The condition of which she complained began about a year previously with abdominal distention and mild distress of an indefinite nature. She had been unable to wear a corset for eight months. Since the birth of her child five years previously, menstruation had been irregular. On one occasion there had been complete amenorrhoea for twelve months. This was followed by a copious flow for twelve days and another period of amenorrhoea. During the last five months there had been irregular bleeding and marked anaemia.

On physical examination the abdomen was found to be regularly enlarged with limited respiratory movement and flaring of the rib margins. On palpation a large, round, elastic, and movable tumor

was felt which was not displaced by changes in the patient's position, and was seemingly attached to the posterior abdominal wall. Between this tumor and the costal margins was a tympanic zone about 5 cm. wide. Pelvic examination showed the cervix to be somewhat dilated, admitting one finger. Occasionally small clots of blood were discharged. The uterus was somewhat enlarged and retroflexed but without adhesions. The left ovary was palpable but the right could not be felt. Deep palpation was not painful.

Curettage was performed and resulted in the suppression of the hæmorrhage. Ten days later a laparotomy was done, the cyst being punctured and extirpated. The right ovary, which was adherent, was also removed. The raw surfaces were peritonized and the abdomen closed in the usual way.

For several days following the operation the temperature was irregular until tenderness developed and a fluctuating mass appeared in the pouch of Douglas. A posterior colpotomy was then performed and a drain inserted. Large quantities of foul pus were evacuated. The patient then made a complete recovery.

From a study of the literature and from their own experience the authors have come to the conclusion that the parovarium resembles a comb, the back of which is parallel to the fallopian tube near the outer segment and the teeth of which converge toward the hilum of the ovary. This structure, which is made up of small canals, possesses a fibromuscular wall and minute lumina lined with low cuboidal ciliated epithelium. It represents a remnant of the sexual part of the wolffian body but its exact function is not known.

Tumors of the parovarium are almost exclusively cysts and probably formed by an abnormal secretion of the lining epithelium. For the most part they are retention cysts rather than proliferating growths. A cystic dilatation of the blind end of the parovarium near the tubal ostium is most common and when it becomes pedunculated, as in the case described, it has the appearance of a cyst of Morgagni.

WILLIAM R. MEEKER.

**Chalier, A., and Dunet, C.: Essential Tubo-Ovarian Varicocele** (Le varicocèle tubo-ovarien essential). *Gynéc. et obst.*, 1920, i, 239.

Tubo-ovarian varicocele is a relatively rare condition. Disturbances of the venous circulation, peri-uterine phlebitis, postpuerperal thrombosis, etc. are found frequently during pelvic operations, but in such cases the pelvic varicocele is secondary to a uterine, adnexal, or more rarely, a rectosigmoid lesion. The varicocele to which the authors refer is a primary uterine varicocele which is unrelated to any pelvic lesion whatever. This condition was first described by Richet in 1860, and in 1909 Camuset was able to find only 7 authentic cases reported in the literature.

The authors report the case of a young woman 20 years of age. On laparotomy the uterus and

right appendages were found to be normal but on the left side was an enormous development of the utero-ovarian veins forming a vascular tumor. The veins were greatly dilated but still intact. The left ovary was small and sclerocystic. The left tube and ovary were ligated and resected. The veins were as large as the internal saphenous vein. The varicose dilations occupied the mesosalpinx. The ovary showed extensive cystic degeneration of the graafian follicles. The lesions were characterized by sclerocystic ovaritis of dystrophic and non-inflammatory origin with marked follicular atresia and hyperplasia of the lutein cells (false corpora lutea).

In the cases described in the literature the diagnosis of tubo-ovarian varicocele was not made until a laparotomy was performed. The authors believe, however, that such a diagnosis is possible although the only sign of the condition is a soft, resistant, pasty pelvic tumor which is only slightly painful on pressure. This tumor increases in volume when the patient assumes the erect position and diminishes in volume or disappears when she lies down. The immediate change in volume occurring when the position is changed alone indicates the presence of a vascular tumor.

The authors do not regard as satisfactory any of the explanations proposed as to the origin of tubo-ovarian varicocele. They believe that the ovary plays an important part in the pathogenesis and the internal secretion of the ovary is the most important factor in the vascularization of the entire genital tract. In tubo-ovarian varicocele there are sclerocystic ovarian lesions characterized by follicular atresia. In such an ovary the number of cells of internal secretion is increased and hyperfunction results. Menstrual congestion is prolonged and intensified, and the congestive disturbance will naturally be reflected in the genital vascular system. The ovarian hormone, therefore, exerts a specific action on the vessels and the vasomotor nervous system associated with the genital vascular system.

The only rational treatment is unilateral salpingo-oophorectomy. This allows the removal of the varicose area with the removal of the tube, the utero-ovarian ligament, and the ovary. Preference should be given to the suprapubic incision of Jayle which leaves no apparent scar.

WILLIAM A. BRENNAN.

**Boribarn-Wetchagit, L., and Ellis, A. G.: Cystadenomyoma of the Fallopian Tube.** *Surg., Gynec. & Obst.*, 1920, xxxi, 77.

The author reports a case of cystadenomyoma of the fallopian tube in a Siamese woman 23 years of age. The symptoms began, when the patient was 17 years of age, with pain in the left side of the pelvis for two days before each menstrual period and also during the period, ceasing when menstruation ceased. This continued until three months after marriage at the age of 21, when pregnancy began. During pregnancy and for seven months after the



delivery of a normal child there were no symptoms. Pelvic pain then began during menstruation and soon became continuous. Repeated pelvic examinations showed the presence of a tumor in the left fallopian tube. As the pains gradually became more severe, leading at times to convulsive seizures, the patient was operated upon. An ovoid tumor about the size of a hen's egg was removed from the left fallopian tube and the patient made an uneventful recovery.

On microscopic examination, the wall of the tumor was found to be composed largely of smooth muscle with some fibrous tissue. The lining of the central cavity was a single layer of columnar epithelial cells. The nuclei were basal. Cilia were not detected. Below this epithelium was a cellular zone very similar to that of the intertubular portion of the endometrium. The cells were round or oval, the nuclei stained quite deeply, and there was a fair amount of intercellular material. This cellular zone gradually merged into the muscle of the growth, no structure resembling a submucosa being present. Evidence of acute or chronic inflammation in any part of the sections was entirely lacking.

The author's reason for recording this case is the rarity of the type of growth described.

CARL H. DAVIS.

#### EXTERNAL GENITALIA

**Robinson, M. R.:** Congenital Absence of the Vagina and Uterus; A Consideration of the Problem in the Light of the More Recent Endocrine Studies and Surgical Advances, with the Report of a Case Successfully Operated upon by the Baldwin Method Slightly Modified. *Surg., Gynec. & Obst.*, 1920, xxxi, 51.

The author comments on the frequency of anomalies of the female generative organs and divides them into three classes: (1) absence of the uterus, (2) absence of the vagina, and (3) absence of the vagina and uterus.

Postpubertal determination of sex depends upon more than the presence of ovaries or testicles. Femininity and masculinity depend upon the proper and harmonious relation and correlation of all the internal secretions.

The patient whose case is reported was a female with all the secondary feminine characteristics and therefore a proper subject for operation. She was 24 years of age and had been married nine months. She consulted the author on account of inability to perform the sexual act. She had never menstruated but from 17 years of age had been subject to periodic attacks of discomfort characterized by dull headache, enlargement of the breasts, swelling of either one or the other extremity, and mild hæmoptysis persisting for four days. The vaginal canal was represented by a blind sac,  $\frac{3}{8}$  in. deep, in the normal situation; no uterus or adnexa could be detected.

When the abdomen was opened a fully developed fallopian tube and ovary with a round ligament was

found on each side. The uterine end of the tube terminated in an enlargement the size and shape of an olive pit which was joined to a similar body on the opposite side, thus forming a septum across the pelvis between the bladder and rectum.

The technique of the operation differed from Baldwin's method in that the dissection was made entirely by the abdominal route, an assistant making pressure from below with a blunt instrument. The other steps of the procedure were similar to those of Baldwin's operation in that a double loop of ileum was used to construct the vagina. Convalescence was normal and the functional result very satisfactory.

SIDNEY A. CHALFANT.

#### MISCELLANEOUS

**Baldwin, J. F.:** The Artery of the Uterine Round Ligament. *Surg., Gynec. & Obst.*, 1920, xxxi, 57.

The author takes exception to the statement found in text-books on gynecology that there is an artery of the round ligament which furnishes an important part of the blood supply of the uterus. The artery of the round ligament of the uterus (the external spermatic in the male) is a small branch of the inferior epigastric. Its main stem descends through the inguinal canal with the round ligament, anastomosing with branches of the external pudendal and, occasionally, with the prolonged funicular branch of the superior vesical. A small branch of this artery accompanies the round ligament inward and anastomoses with branches of the uterine, ovarian, and vesical to the round ligament.

The uterine and ovarian arteries anastomose, forming an arterial arch which gives off branches to the round ligament. These branches accompany the ligament outward, anastomosing with funicular branches from one or more of the vesical arteries and a proximally directed branch from the artery of the round ligament.

The funicular artery, a branch of the superior vesical (the artery of the vas deferens in the male) or, occasionally, from the inferior vesical, is a small slender artery which accompanies the round ligament outward from the point where the ligament crosses the artery, anastomosing with branches from the uterine, ovarian, inferior epigastric, and external pudendal. The branches to the round ligament derived from the uterine, ovarian, and vesical may give off proximally directed branches which extend inward to the attachment of the ligament to the uterus.

In diseases of the uterus, ovaries, or tubes any of the vessels to the round ligament may become enlarged.

In more than three thousand abdominal hysterectomies the author has freely cut across the round ligaments and in only one instance was there arterial bleeding. In that operation the uterus was the seat of puerperal infection and in Baldwin's opinion the hæmorrhage was due to the inflammatory condition.

SIDNEY A. CHALFANT.

**Hammond, F. C.: The Relation of Appendicitis to Intrapelvic Disease in Women.** *N. York M. J.*, 1920, cxi, 978.

Appendicitis in the female may be mistaken for pyosalpinx, ovarian abscess, suppurating ovarian cyst, torsion of the pedicle of an ovarian cyst, ectopic gestation, abortion, or dysmenorrhœa.

The author emphasizes the necessity for a careful history in every case. Acute pelvic inflammation is usually preceded by vaginal discharge and dysmenorrhœa, and appendicitis, by digestive disturbances or previous attacks of pain on the right side. The acute pain is at first general and colicky and later becomes localized. In pyosalpinx the pain is more constant and less severe and is situated lower in the pelvis, the tenderness being frequently most acute over Poupert's ligament. In the other conditions a carefully taken history and physical examination usually make the diagnosis clear.

The author draws the following conclusions:

1. The more we see of appendicitis the greater respect we have for it. Those who have not had a large experience will find that what at first seemed to be a straightforward disease is one of the most treacherous and difficult to treat. The different types of appendicitis may be distinguished only on the basis of a large experience and even then such differentiation is frequently difficult.

2. The history should be taken carefully in the case of every patient.

3. The right chest should be carefully studied.

4. A bimanual or recto-abdominal examination should be part of the physical examination of every female patient beyond the age of puberty.

5. If at the time of operation an incision is made for the exposure of the appendix without respect to the physical condition of the appendix, the surgeon's finger should be passed into the right pelvis to palpate the right adnexa.

S. A. CHALFANT.

**DeRom: Plastic Surgery of the Perineum** (Ueber Perineoplastik). *Vlaamsche geneesk. Tijdschr.*, 1920, i, 169.

The treatment of prolapse of the vagina and uterus with pessaries is being abandoned because of the resulting inflammation. The method of choice today is perineorrhaphy. This consists in the formation of a pelvic floor by means of silver wire which is drawn about the pubic bone and the upper or lower ramus and tightened with a clamp. From experiments on the cadaver and from anatomical plates it is clear that in this operation there is no danger of injuring important vessels. Tying off of the pubic vessels and nerves by the wire about the bone may be avoided by tying the wire loosely.

This operation was performed on 4 women with successful results in 3 cases. In 1 instance the condition recurred after a time as the wire broke. Because of the limited flexibility of wire the author recommends the use of silk or silk thread instead.

SCHMITZ (Z).



# OBSTETRICS

## PREGNANCY AND ITS COMPLICATIONS

**Paddock, C. E.:** *Diet in Pregnancy. Surg., Gynec. & Obst.*, 1920, xxxi, 71.

The normal gain in body weight of the mother throughout pregnancy amounts to between 20 and 30 lbs., and during the last three months there is a gain of from 3 to 5 lbs. a month. However, in the first three months the balance of gain is negative as a large percentage of women are nauseated or vomit, or have such a distaste for food that they cannot eat. The increase in tissue outside of the uterus occurs chiefly in the pelvis and abdominal walls, but there is also a general increase in all the tissues. Although it would be reasonable to suppose that such an increase in tissue would call for a greater amount of food, this is not the case. The added weight is comparable to a neoplasm or to weight gained without any apparent reason.

The author does not agree with the theory of Prochownick, published in 1889, that the size and weight of the foetus can be lessened by placing the mother upon a protein diet and limiting other foods. The consensus of opinion is that the food taken by the mother has little if any effect upon the growth of the foetus, and that the foetus will thrive at the mother's expense even if her condition is below normal. Not infrequently, however, articles appear in the medical journals in which the diet advocated by Prochownick is recommended, in spite of the fact that no definite data have been found to substantiate the theory.

From reports of physiologists we must conclude that under normal conditions and when the mother's diet is her normal diet in the non-pregnant state, the foetus will grow by taking its nourishment from the mother's food and selecting only those substances in sufficient quantity which are necessary for normal growth. Because of this selective process on the part of the placenta a diet rich in carbohydrate and deficient in protein will in no way affect the foetal growth.

The belief of the laity that a woman needs more food during pregnancy than before is correct only if she is working at the time. In the cases of women of the leisure class and those who refrain from all bodily exertion from the beginning of pregnancy, it is better not to increase the quantity of food. If it is increased, bodily exercise is necessary.

Physiologists tell us that to maintain metabolic equilibrium for twenty-four hours, a woman of average body weight who does an average amount of work requires 100 gm. of albumin, from 80 to 100 gm. of fat, and 400 gm. of carbohydrate. To include these elements the diet must be mixed. Of the three principal elements of nutrition albumin is the

most important. The most necessary salts are lime, sodium, phosphorus, and the salts of iron.

The author discusses the various vegetable, carbohydrate, and milk diets, and concludes that while all of them are good, a mixed diet is necessary in order to supply the essential food elements. The best plan is for the physician to find by observation the amount of air, exercise, rest, and food which is required in each case and to keep the patient under observation so that he may be able to make any necessary changes. CARL H. DAVIS.

**Herrick, W. W.:** *Some Phases of the Circulatory Disturbances of Pregnancy: with an Illustrative Case. Med. Clin. N. Am.*, 1920, iv, 179.

The diagnosis on admission to the hospital in the case reported was cardiac dilatation with insufficiency of the mitral, tricuspid, and pulmonary valves; arterial hypertension; congestion of the lungs and liver; moderate anasarca and paroxysmal dyspnoea.

In the treatment a salt-free diet was given and the fluid intake restricted to 1,200 ccm. in twenty-four hours. Digitalis in the form of digipuratum, 1½ gr., was administered three times every twenty-four hours. This regimen was alternated with periods of three or four days of the Karell diet. To stimulate diuresis an occasional dose of 10 gr. of diuretin was given. With sufficient doses of digitalis the pulse rate was maintained between 60 and 80.

The result of this therapy was very satisfactory. During the first month there were no attacks of paroxysmal dyspnoea and the orthopnoea became less. The area of cardiac dullness diminished. The systolic blood pressure receded but the diastolic remained around 100. The patient left the hospital in ten weeks. She was then in the sixth month of pregnancy. From reports received from time to time it appears that there has been no material change in her condition. The Wassermann reaction was negative.

Since the patient left the hospital the chief dietary restriction has been salt and animal food, such as sweetbreads, liver, and kidneys, which contain an excess of nuclein. The restriction of salt seems to cause a decrease in the blood pressure.

As regards the prognosis in these cases, Herrick states that while in many the heart and blood pressure become normal, in the majority there is impaired myocardial reserve and a blood pressure which, if not high, at least tends toward the higher ranges and has an exaggerated response. In other words, the foundation of chronic hypertensive cardiovascular disease is laid with all the future menace of cardiac insufficiency, cerebral hæmorrhage, or arteriosclerotic nephropathy.

While further pregnancies need not be forbidden, the risk must not be considered lightly, and if pregnancy does occur the patient should be under the constant supervision of a competent internist.

EDWARD L. CORNELL.

**Jardine, R., and Kennedy, A. M.: Suppression of Urine in Pregnancy and the Puerperium; Its Relation to Symmetrical Necrosis of the Renal Cortex.** *Lancet*, 1920, cxcix, 116.

The author reports 12 cases in which suppression of urine occurred as a complication of pregnancy or the puerperium. Eleven of the cases are described in detail.

Pathologic reports of the condition of the kidney were available in 8 cases. Symmetrical necrosis of the renal cortex was found in 6 instances; in 3 of these there was evidence of pre-existing chronic inflammatory changes, while in 3 others the condition was proved to be pure cortical necrosis. The remaining 2 of the 8 cases showed chronic interstitial nephritis only. The suppression of urine, therefore, may be due to one or both of these causes. It is impossible to determine clinically which of these conditions is present.

Focal necrosis was found in organs other than the kidney in 5 of the 6 proved cases. Renal cortical necrosis seems to be a form of focal necrosis. The authors attribute the distribution of the necrosis in the outer two-thirds of the cortex to differences in the blood supply. Thrombosis of the vessels near the necrosed area was discovered in every instance.

Glynn called attention to the presence of platelets in the distal portion of the thrombus and concluded that the thrombi are due to injury of the vascular endothelium. Arteriosclerosis, which may also be a contributory cause, was found in three kidneys. It is evident that the primary cause is a toxin peculiar to eclamptic conditions, since in fatal cases of eclampsia focal necrosis in some organ is an almost constant finding.

Decapsulation and nephrotomy are unsatisfactory as are all means of treatment instituted after the condition is well established. The authors emphasize the importance of the early recognition of the toxic state and treatment by elimination and counteraction of the toxins before vascular changes and necrosis of the tissues have occurred.

G. S. FOULDS.

**Guerin-Valmale and Vayssi re, H.: The Effects of Antityphoid Vaccination on Pregnant Women** (Sur les effets de quelques vaccinations antityphoidiques chez des femmes enceintes). *Gyn c. et obst.*, 1920, i, 217.

Since 1913 the authors, following previous work of other investigators, have employed antityphoid vaccine experimentally in animals and clinically in the cases of pregnant women. The vaccine used was a monovalent vaccine containing 500,000,000 bacilli per cubic centimeter. The dosage given was  $\frac{1}{2}$ ,

$1\frac{1}{2}$ , and 2 ccm. injected at intervals of one week into the extensor surface of the arm.

In the animals positive agglutination was demonstrated in all the offspring but this power was only one-third that of the mothers. All of the offspring of rabbits which were vaccinated were either still-born or died within a few days of birth. The dosage given, however, was very high for the weight of the animal.

The vaccination of women was carried out in a maternity clinic during the last six weeks of pregnancy. About four injections were given. The results may be summarized as follows:

1. The injections did not appear to have any harmful effects on the f etus *in utero*.

2. Pregnant women reacted to the vaccine in the same way as non-pregnant women and the normal blood changes of pregnancy were not altered by the vaccine.

3. The agglutinating power of the milk rose with the number of injections up to the third, when the maximum was reached. The agglutinating power of the lactoserum was always lower than that of the blood serum when both were determined simultaneously. The mammary epithelium appeared to delay the passage of the agglutinins but was not an absolute barrier.

4. A study of the f etal sera showed that as a general rule its agglutinating power was less than that of the mother although in some cases it was equal and in one case much higher.

In the authors' opinion the origin of the agglutinins in the f etal blood is usually maternal, the f etus being passively immunized, but there is reason to believe that in some cases there is active immunization of the f etus.

WILLIAM A. BRENNAN.

**Torre y Blanco, J.: The Classical C esarean Section in the Treatment of Certain Forms of Bronchopneumonia in Pregnancy** (La cesarea clasica como tratamiento de algunas formas de broncho-neumonia durante el embarazo). *Siglo med.*, 1920, lxvii, 204.

The gravity of bronchopneumonia is considerably increased when it occurs as a complication of pregnancy, and the more advanced the pregnancy the more serious the condition. In the author's experience the majority of such cases terminated fatally when the gestation was further along than six months.

Three clinical types of bronchopneumonia in pregnancy are recognized. In the first type general septic emic manifestations are more important than the local pulmonary condition. There is high fever with great prostration and evidences of myocardial insufficiency. In these cases, especially when the infection is severe, premature labor and abortion occur, the f etus usually being born dead or dying within a few hours after birth. As a general rule such cases terminate fatally in spite of the employment of cardiac tonics, stimulants, and polyvalent vaccines.



In the second type the general condition aside from the local pulmonary infection may seem satisfactory. Nevertheless rapid abortion followed by severe systemic symptoms frequently occurs. The treatment is the same as that indicated for the first group of cases.

In the third form the condition may be very grave but is due to the mechanical circulatory phenomena brought on by the advanced gestation rather than to the virulence of the infection. In such cases, in which the septicæmic manifestations are not marked, a cardiac crisis may be experienced with is characterized by marked cyanosis, pronounced dyspnoea, and a fast pulse of low tension. In such cases the classical cæsarean section under spinal anaesthesia has been performed with good results. Details of 2 case histories are given in which such a procedure was followed by uneventful recovery.

From these results and those of other similar cases the author concludes that in cases of bronchopneumonia in advanced pregnancy in which the only grave symptom is cardiac insufficiency from mechanical causes and grave systemic manifestations of sepsis are absent the treatment indicated is that of immediate cæsarean section under spinal anaesthesia. Great care should be taken in the selection of the cases, however, and cases of cardiac insufficiency from mechanical causes must not be confused with those of acute myocarditis from the toxæmia of a virulent lung infection.

WILLIAM R. MEEKER.

**Villar, A.: The Treatment of Inevitable Abortion**  
(Sobre el tratamiento del aborto inevitable). *Rev. argent. de obst. y ginec.*, 1920, iv, 10.

Villar classifies abortions into afebrile and febrile abortions. In the former the condition is usually not grave and, aside from the slight danger of perforation during treatment, uneventful recovery is the rule. The abortion becomes febrile when bacteria enter the uterine cavity and infect the mucosa. Little bacterial growth occurs during the first and second days of the puerperium, probably because of the bactericidal power of the blood and serous secretions of the uterus at that time. During the third day, however, the invading bacteria usually begin to multiply, and on the fourth day increase in numbers with great rapidity. Between the seventh and the ninth days they are fully developed and the uterine discharge may contain any of the organisms of puerperal infections.

There are three principal bodily defences against the entrance of infection: the lochial discharge which contains antitoxic and bactericidal substances; the migration of leucocytes; and the formation of new granulation tissue. The formation of new tissue is the most important factor as fully developed tissue is so compact and membranous that it acts as an impermeable wall to the progress of microorganisms.

An infected uterus may be compared to a phlegmon or abscess in any other part of the body, but the infection is more serious because of the ease with

which the toxic substances are absorbed. As soon as bacteria localize the submucous vessels dilate, the serous discharge increases, the leucocytes migrate to the area of inflammation, and granulation tissue is formed. The bacteria, on the other hand, multiply, eliminate toxins, and tend to invade the lymphatics and blood stream. When the patient experiences a chill the bacteria have undoubtedly entered the circulation so that at this stage a metastatic focus of suppuration or a thrombophlebitis may result. If the bacteria in such a case are highly virulent, the case usually terminates fatally. All therapy is useless, death usually occurring within three or four days after the abortion.

Patients with induced septic abortion rarely seek medical attention at the first appearance of fever. They regard fever lightly and are usually assured by the midwife, who is commonly to blame, that fever and chills are to be expected. At this stage curettage is most dangerous, even though the operator is highly skilled. A single small abrasion in the uterine mucosa may be responsible for the continuance of the infection, and if a dull curette is used it is possible that not only a small portion of the infected placenta but also decidua may be left in place. The introduction of any instrument into the uterine cavity when the bodily defenses are being organized tends therefore to facilitate the penetration of bacteria into the lymphatics and blood stream. In the author's opinion even digital curettage should not be employed as it necessitates dilating the cervix, the uterus is more or less massaged with the external abdominal hand, and complete digital extraction is difficult to perform.

In febrile abortion the author aids the natural forces in emptying the uterus. An ice bag is kept constantly on the abdomen to favor uterine contractions and 0.2 gm. of quinine is given every four or six hours. In from 40 to 50 per cent of cases uterine contractions usually appear after the second dose of quinine and result in the expulsion of the ovum and placenta. All lavage, irrigation, and douches are forbidden. The vulvar dressings are changed three or four times daily.

Cases in which abortion cannot be effected by this method are generally left alone for three or four days. During this time the temperature usually returns to normal. Curettage is then performed and is easier and less dangerous as the uterine cavity is almost empty, the uterus is small, and the uterine walls are firmly contracted.

There are two contra-indications to the author's method of treatment, one absolute and the other relative. Violent hæmorrhages which endanger life constitute the absolute contra-indication, but such hæmorrhages rarely occur with high temperature. The relative contra-indication is retroflexion of a gravid uterus in which conditions are not favorable for the spontaneous evacuation of the products of gestation. In such cases curettage may be done after correction of the retroflexion.

WILLIAM R. MEEKER.



## LABOR AND ITS COMPLICATIONS

**De Lee, J. B.:** *The Treatment of Obstinate Occipito-posterior Positions.* *J. Am. M. Ass.*, 1920, lxxv, 145.

In practice, there are two classes of cases: first, those in which the head is engaged, and second, those in which the head is in or above the inlet. When the head is high and floating, interference is not necessary, but a careful search should be made for any condition which of itself may demand treatment. Watchful expectancy is the course to pursue. Rupture of the membranes should be prevented, if possible, because labor is more often retarded than hastened by it. Morphine and scopolamine should be used in the first stage to prevent exhaustion of the mother and child, but it is not wise to let labor drag on too long.

By means of a colpeurynter the dilatation of the cervix may be completed and the case thus prepared for interference if necessary. After complete dilatation of the cervix the author usually waits an hour or two to see whether or not the head will engage. If it does not, he punctures the membranes after placing the patient on her side to prevent prolapse of the cord. If the head does not engage very soon, two courses of procedure are open: version, followed by extraction if necessary, and manual correction of the position. In the cases of multiparæ the obstetrician's preference may be exercised.

De Lee warns against the use of forceps in such high head cases. If descent, rotation, and extraction are forcibly effected by forceps, the child is always injured and often killed, and the mother is also maltreated. This is one of the most common causes of stillbirth and puerperal infection.

After the head is engaged the case is gratifyingly simplified. If the cervix is fully dilated and the pains are good, a little pressure upward on the forehead during a pain may aid flexion and favor rotation (Hodge's manœuvre). It may be possible to direct the head backward with two fingers placed alongside the forehead on the anterior lateral inclined plane of Hodge or to draw the occiput forward with three fingers as Tarnier suggested. These simple procedures with the patient placed on the side toward which the occiput points should give results. If they do not or if rectal examination shows that the occiput has rotated to the sacrum the patient should be etherized and the head rotated to the proper position by combined internal and external manipulation. As a rule, contrary to what is usually taught, this is not difficult; the chief difficulty has been the holding of the head in its new position sufficiently long to apply the forceps. As soon as the fingers are off the head, it rotates back again to its former position. This can be prevented by the simplest means. After rotation has been accomplished, the scalp should be grasped firmly with a double vulsellum or 8-in. artery clamp, and the head held in the proper position by an assistant until the forceps can be applied.

De Lee has performed this operation often and always successfully. He therefore recommends it for general practice. When done carefully and gently it is not harmful. After delivery the small wounds are touched with tincture of iodine. Even when the head has not been engaged De Lee has succeeded in rotating and holding it in position with a vulsellum, but states that it is best first to effect the rotation by hand.

EDWARD L. CORNELL.

**DeLee, J. B.:** *The Treatment of the Second Stage of Labor with Special Reference to the Prevention of Injury to the Child and to the Pelvic Floor.* *Minnesota Med.*, 1920, iii, 317.

The author expresses the opinion that labor is no longer a normal function and mentions several factors which render it pathogenic.

For the mother there is always the danger of infection even under the most ideal conditions. Virulent streptococci are present in the vagina in a large number of cases, and if the second stage becomes too prolonged and the woman's resistance is lowered they may prove fatal. Exhaustion and rupture of the uterus are other possible dangers. In a very complete summary the author shows also how injuries to the pelvic floor and perineum are related to many of the complications of pregnancy.

The dangers of the second stage of labor to the child are much greater than is generally believed. The most common dangers are asphyxia from abruptio placentæ or prolonged compression of the brain, and intracranial hæmorrhage. Statistics seem to show that instrumental delivery is safer than prolonged, difficult unassisted labor. Among the late effects of prolonged labor are permanent disorders of sight and hearing due to hæmorrhages into the nerve endings, the nerve itself, or its nuclei.

In discussing the treatment of the second stage of labor the author mentions several of the routine points in the management, and then discusses in particular the preservation of the pelvic floor and outlet tissues and the prevention of injury to the child. When the pelvic floor is rigid DeLee shortens the second stage artificially with the "prophylactic forceps." When the head has reached the pelvic floor and the levator ani muscles have begun to stretch he considers the advisability of interference. If the pains are strong, a few whiffs of ether or gas are given and a deep episiotomy is done. Usually then the patient will be able to deliver herself. If the pains lag, however, two or three drops of pituitrin are given. If the pains are not strong, or if the head reaches the pelvic floor after a second stage lasting longer than from forty-five to sixty minutes, or if the rotation is not complete within this time, the use of the prophylactic forceps is indicated. Under complete ether anaesthesia the pelvic floor is incised and the head rotated anteriorly. Just after the head is brought through the vulva 1 ccm. of pituitrin is given hypodermically. In a few minutes the uterus contracts and expels the placenta into the upper vagina. From the upper



vagina it is expressed by pressure on the fundus, the other hand being placed in the vagina for the placenta to slide upon in the same way as the heel slides down on a shoe horn. This procedure DeLee calls the "shoe-horn manoeuvre." Immediately after the placenta is delivered 1 ccm. of aseptic ergot is given intramuscularly.

As soon as the uterus is contracted the cervix is examined and all cervical tears are repaired.

The perineotomy is one of the most important parts of the prophylactic forceps method as it is intended to preserve the integrity of the pelvic floor, the subvesical fascia, and the urogenital septum, and at the same time to prevent injury to the child's brain. The author makes the incision when the levator ani and fascia have been stretched a little, but have not begun to tear. Beginning at the raphe in the fourchet, the skin and urogenital septum are cut with one sweep of the scissors. This exposes the levator ani pillar. The perineum falls to the opposite side, its apex attached to the fascia over the rectum and the edge of the levator ani. The vagina and the fascia over the levator ani are incised next and then the levator is cut more or less extensively, depending on the estimated size of the child, the cut being made almost horizontally in about the middle of the muscle. Bleeding is usually stopped by pressure with gauze sponges, but occasionally ligation of a vessel is necessary.

In the repair the author simply unites the parts in anatomicosurgical fashion. In the forceps delivery he follows the standard rules.

The prophylactic forceps operation is a radical departure from time-honored custom but has a sound scientific basis. It saves the woman the physical labor of a prolonged second stage and when morphine and scopolamine are given in the first stage and gas or ether is used in the second stage with operative delivery, labor is robbed of most of its terrors. The method undoubtedly preserves the integrity of the pelvic floor, the vesicovaginal septum, and the introitus vulvæ and forestalls the long train of sequelæ following pelvic laceration. In addition it saves the child's brain from the immediate and remote effects of prolonged compression. Incision in the soft parts not only shortens the second stage of labor, but also relieves the pressure on the brain and consequently will reduce the number of cases of such conditions as idiocy and epilepsy.

CARL H. DAVIS.

**Palmer, A. C.: Two Cases of Rupture of the Vagina during Labor.** *Proc. Roy. Soc. Med.*, Lond., 1920, xiii, Sect. Obst. and Gynæc., 151.

Case 1. The patient was admitted to the hospital following a difficult extraction, by means of the forceps, of a still-born child weighing between 13 and 14 lbs. The perineum was torn. The placenta had been removed from the abdominal cavity through the ruptured cervicovaginal juncture. The woman was very anæmic and in a state of collapse. The pulse was 120, the temperature 98°

F., and the abdomen very tender. Laparotomy was done at once.

On examination of the pelvis the uterus was found free of all attachments to the vagina except for a narrow bridge in the region of the left uterine artery and a small portion of the anterior wall of the cervix close to the bladder. The cervicovaginal juncture was torn through for more than three-quarters of its circumference. The uterus was removed as rapidly as possible, all bleeding points being ligated. Intravenous saline was given. Except for a slight rise in temperature the patient made an uneventful recovery.

This woman had had eight children previously, and there had been no difficulty in any of the other labors. The pelvic measurements were normal.

Case 2. The patient, a woman aged 41, was brought to the hospital by a midwife who had been attending her. The labor pains had been severe for some hours but there was no progress and the woman was in a state of collapse. The pulse rate was 120 and the temperature 96.5° F. The abdomen was tender, the head of the fœtus was impacted in the brim but not engaged, and the fetal heart was not heard. Forceps were applied easily, but as no advance of the head was obtained with a moderate pull, the child was delivered after perforation and crushing of the head. On examination it was found that the child had been in the abdominal cavity. The placenta was manually removed from the abdominal cavity.

An exploratory laparotomy revealed a large T-shaped tear in the posterior vaginal wall, beginning at the cervicovaginal juncture and extending almost down to the vulva. The uterus was quickly removed and the bleeding vessels ligated. Drainage *per vaginam* was maintained for twenty-four hours. One and a half pints of intravenous saline were given. The operation was followed by incontinence of urine and fæces for four days, and total incontinence of urine for ten days, but after that the patient made a good recovery.

This woman had had five children previously. Four easy labors had occurred in spite of a well-marked general contraction of the pelvis; the fifth required forceps; the sixth ruptured the vagina almost completely and made laparotomy with hysterectomy necessary.

In both of these cases the purpose of the hysterectomy was twofold: (1) the control of hæmorrhage; (2) the removal of damaged and devitalized tissue as a prophylactic measure against puerperal sepsis.

CARL B. DAVIS.

## PUERPERIUM AND ITS COMPLICATIONS

**King, E. L.: Non-Interference in the Treatment of Puerperal and Postabortal Infections.** *J. Am. M. Ass.*, 1920, lxxv, 147.

In the treatment employed by the author a special ward is set aside for all white patients suffering from puerperal infections and is employed

also for the medical treatment of all other complications of pregnancy and the puerperium. It is in reality a rest ward since no patient requiring a major operation is admitted to it. On admission, a careful, general, aseptic bimanual examination is made. At the same time a culture is taken from the uterine cavity with a Little's tube if the cervix is sufficiently patulous, but if it is firmly closed, this step is eliminated as dilatation would of course entail a certain amount of traumatism. If retained placental tissue is presenting through the partially dilated cervix, it is gently removed with the finger or the ovum forceps. No other local manipulation in or out of the uterus is performed. The patient is put to bed, and if the infection is of recent origin and appears rather virulent, the head of the bed is elevated. The object of the Fowler position is to facilitate drainage and, if possible, to limit the infection to the pelvis.

Hyperpyrexia is controlled by hydrotherapy. Mild fever requires no treatment. Fluids (chiefly water) are supplied plentifully—by mouth, if tolerated, by rectum, when indicated, and at times by hypodermoclysis or intravenous saline infusion.

The bowels are kept open by enemas. Saline laxatives are given only occasionally. In the infrequent cases of nausea without peritoneal involvement small doses of calomel are sometimes administered. In cases of pelvic cellulitis or pelvic peritonitis a light ice bag is applied to the hypogastrium, and when the acute local symptoms have subsided the employment of copious douches of plain hot water twice daily is begun. Weeks may pass, however, before the patient is ready for this part of the treatment.

Drugs are considered secondary to the general supportive measures.

Experience with various methods of treating septic abortion has convinced the author that the best results are obtained by letting the uterus alone until the temperature is normal and the uterine culture becomes negative. The only exceptions are: (1) cases in which placental tissue appears through the open cervix, and (2) cases of profuse bleeding due to the retained fragments. Many of these patients will need a curettage later on account of the menorrhagia due to endometrial changes consequent to this retention.

Summing up the immediate results, there were 33 severe cases of blood-stream infection with 8 deaths (2 of these patients were moribund on admission); 23 cases of pelvic cellulitis, in 17 of which the exudate disappeared completely, in 4 of which drainage of abscesses developing late completed the cure, and in 2 of which injudicious operation resulted fatally; 4 cases of fulminant peritonitis with 4 deaths; and 266 cases of abortion, complete or incomplete in all of which there was complete recovery (86 of these patients had slight fever for a few days). The patients the author has seen subsequently were in good health and had no pelvic symptoms. Some of them have since passed through normal pregnancies and labors. None of them has been admitted to the gynecological service for operation for tubal or ovarian infection, and few, if any, have returned to the other gynecological wards of the hospital.

As about 50 per cent of the cases of salpingitis operated on are traceable to abortion followed by some form of active local treatment, the author regards the policy of non-interference as the best policy in the types of infection under discussion.

EDWARD L. CORNELL.



# GENITO-URINARY SURGERY

## ADRENAL, KIDNEY, AND URETER

**Richey, D. G.: Leukoplakia of the Pelvis of the Kidney—A Study in Metaplasia.** *J. Lab. & Clin. Med.*, 1920, v, 635.

This paper is based upon the study of a case of leukoplakia of the right kidney pelvis. The patient, a man 43 years of age, had suffered for a period of twenty-two years with periodic paroxysms of pain following an injury to his back. The typical attacks of renal colic were associated with pus, blood, mucus, and albumin in the urine. Cultures yielded bacillus coli and bacillus acidi lactici.

The lower two-thirds of the excised kidney appeared normal. The upper one-third presented numerous cavities with only a narrow rim of kidney substance remaining. These cavities communicated freely with the pelvis and were lined by a white, silvery, finely wrinkled membrane similar to the delicately corrugated skin of the infant's scrotum. The surface of the membrane was firm and unbroken as it extended in fine processes upon the injected walls of the lesser cavities. The pelvis showed a similar metaplasia which continued downward along the ureter and resembled the streaks of leukoplakia seen at the lower end of the oesophagus. There was no evidence of calculus or caseation.

Sections showed the lining to consist of a thick layer of stratified epithelium presenting a large amount of keratinization on the free surface. This was uneven in thickness, varying from ten to eighteen cells in depth. In the intermediate zone polyhedral cells with definite intercellular bridges similar to the prickle cells of the epidermis were noted. No membrana propria could be demonstrated, the deepest layer of epithelium resting directly upon a bed of granulation tissue which it exhibited no tendency to invade. The supporting muscle bundles had been extensively fragmented.

The pathologic diagnosis was chronic suppurative pyonephrosis and ureteritis; leukoplakia of the pelvis of the kidney and the ureter.

The author states that we do not hesitate to explain leukoplakia of the renal pelvis and ureter upon the theory of metaplasia as a histogenic transformation induced by the alteration of environment wrought by a long-standing inflammatory process. This inflammatory process is believed to cause a change in the morphology of the cells from the normal transitional to stratified squamous epithelium, even to the formation of a superficial layer of keratin, a quality, which as Wells points out, might be interpreted as an intrinsic chemical alteration in the cells due to abnormal stimuli.

The author's laboratory findings coincide with those reported by Braasch, i.e., that with dilatation of the

chronically inflamed pelvis and ureter, limited proliferation and cornification of the mucosa is often seen. Until this process is sufficiently advanced so that it can be recognized in the gross as a definite whitish patch it is not leukoplakia but represents only a stage in the process. Although leukoplakia of the renal pelvis and ureter is not rare, it is less common than leukoplakia in the lower urinary passages. It is associated with chronic forms of irritation such as nephrolithiasis and inflammatory processes, either pyogenic or tuberculous.

The clinical manifestations of leukoplakia are usually those of the underlying factor, but the passage of desquamated epithelial plaques has been known to give rise to typical attacks of renal colic. In a certain percentage of cases of long-standing pyelitis which are not amenable to appropriate treatment it is reasonable to suspect that cornification or leukoplakia of the pelvic mucosa has occurred.

HARRY A. FOWLER.

**Hyman, A.: Renal Calculus with Negative X-Ray Findings.** *Boston M. & S. J.*, 1920, clxxxiii, 74.

Hyman states that a negative radiogram is insufficient evidence of the absence of a calculus in any part of the genito-urinary tract. The lower the stone the greater the chance of its being missed roentgenographically. Renal stones fail to show in from 6 to 15 per cent of the cases; ureteral stone, in from 15 to 30 per cent; and vesical stone, in 60 per cent. In 5 of his own cases in which the X-ray examination was negative the stone was formed chiefly of ammonium urates. Three of these patients died following operation and the postmortem examination revealed stones in both kidneys. The fourth passed a yellow stone five days after the examination. The fifth recovered after the removal of a stone.

The causes of the failure of the X-ray examination are faulty technique, obesity, and the chemical composition of the stones, urates and uric acid being translucent to the X-ray. Freyer states that many stones which are not translucent will not throw a shadow when they are surrounded by inflamed kidney, condensed fat, pus, or layers of fibrin.

The author summarizes his conclusions as follows: A negative X-ray examination means nothing. Latent kidney stones are frequent. In such stones the urates are the predominating constituent. The passage of a ureteral catheter into the pelvis does not prove the absence of a ureteral calculus. Wax-tipped bougies will often demonstrate the presence of a stone when other means fail. Conservation is the watchword in renal surgery. A nephrectomy should be done only as a last resort as the opposite kidney may be the seat of calcareous disease.

BENJAMIN F. ROLLER.

**Thompson, L.: Syphilis of the Kidney.** *J. Am. M. Ass.*, 1920, lxxv, 17.

The importance of syphilis of the kidney is often overlooked. The text-books on medicine pay scant attention to the subject. Renal syphilis was first recognized clinically by Rayer in 1840. The condition consists of the following varieties:

1. Early involvement: (1) transient albuminuria; (2) acute and subacute nephritis.
2. Late involvement: (1) chronic interstitial and parenchymatous nephritis; (2) amyloid kidney; and (3) gummata.

Transient albuminuria is due to the toxins of the spirochaetes and represents the response of the tissues to toxic irritation. There are degenerative changes in the epithelium of the convoluted tubules and a small quantity of coagulated serous exudate in the glomeruli.

Acute syphilitic nephritis may occur at any time after chancre but commonly develops about the fifth month. It is insidious in onset and characterized by oedema, anasarca, ascites, asthenia, loss in weight, lumbar pains, nausea, and oliguria. A large quantity of albumin and numerous tube casts, leucocytes, epithelial cells, and lipoids are found in the urine.

Chronic syphilitic nephritis both of the interstitial and the parenchymatous types occurs from three to ten years after infection. In both forms the blood pressure is high and the urine contains albumin and casts. The parenchymatous type is characterized by oedema, anæmia, and high specific gravity of the urine.

The syphilitic amyloid kidney is found late in renal syphilis. This condition is characterized by oliguria, a large quantity of albumin in the urine, anæmia, oedema, and low blood pressure.

Gummata of the kidney occur late, seldom before the fourth year, and are of slow and large growth. The urine is normal except for a trace of albumin. Symptoms resembling those caused by stone or malignant tumor may develop.

The diagnosis of these conditions depends largely upon the history and other manifestations of syphilis, a positive Wassermann test, the presence of spirochaetes in catheterized specimens, and particularly the favorable effect of specific treatment. It should always be borne in mind, however, that nephritis of other etiology may occur in the syphilitic patient.

The prognosis of syphilitic conditions of the kidney is better than that of similar conditions which are not syphilitic as the former, with the exception of the amyloid syphilitic kidney, readily clear up following specific treatment. The amyloid syphilitic kidney is most resistant to specific treatment and usually fatal.

The treatment of renal syphilis should be directed toward the syphilis and toward the kidney condition. In the transient albuminuria specifics and general treatment alone are indicated. In all nephritic conditions specifics must be administered with extreme

caution, the urine being examined for albumin and casts.

In cases of acute nephritis rest in bed is necessary. The diet should be nourishing and consist largely of carbohydrates. Diuretics, such as digitalis and potassium citrate, and cathartics should be administered, and hot packs applied to promote diaphoresis. Mercury should be withheld until the urine is free or nearly free from albumin, while arsphenamine should be administered in doses not to exceed from 0.1 to 0.2 gm. given at weekly intervals.

In cases of gummata large doses of potassium iodide, mercury, and arsphenamin are indicated.

BENJAMIN F. ROLLER.

**Michaelsson, E.: The Results of Operative Treatment of Hypernephroma from 1896 to March, 1915** (Resultat der operativen Behandlung des Hypernephroms 1896-März, 1915). *Hygiea*, Stockholm, 1920, lxxii, 220.

Various opinions have been expressed regarding the nature of the hypernephroma or tumor of Grawitz and the value of operative treatment. The theory that the tumor is of renal origin seems to the author more reasonable than the theory of Grawitz ascribing it to the suprarenal. Kroenlein, Israel, and Berg consider the growth very malignant. Rovsing's findings, however, are more encouraging. In 58 cases of carcinoma of the kidney Rovsing found that 39.6 per cent remained cured for four years after nephrectomy. Paschen also reviewed a large number of cases treated surgically. In 54 cases of his own 35.19 per cent of the patients remained well after three years, while in 268 cases he collected from the literature 17.17 per cent were reported as cured. Paschen has been criticised, however, as in his report he included cases operated upon less than three years before. According to Rovsing, recurrences and metastases take place even after six, eight, and ten years. Often the patients are so old at the time they are operated upon that they die subsequently of other diseases before the results of the operation for hypernephroma are definitely established.

The histology of the tumor does not warrant definite conclusions regarding the prognosis. Aside from the character of the cellular elements of the growth itself, the relation of the tumor to the surrounding tissues is important.

The author's statistics comprise 30 cases operated on between 1896 and 1915. Seven of these patients are alive fifteen, twelve and a half, nine and one-third, nine, seven and two-thirds, four and one-half, and four years after operation respectively. Four died as the result of the operation; 6, from recurrence or metastasis during the first three years, and 3, after three years. Of the latter, 1 died ten years, and 1, four and one-half years after the operation. In the remaining 10 cases death occurred from intercurrent diseases, 5 of the patients living only one and one-half years after the nephrectomy.



Evidently in some of these cases recurrence or metastasis would have developed. The operative results are therefore no worse than those of operations for other malignant growths. Early diagnosis, X-ray examinations, and operation for diagnostic purposes will improve them. Rovsing holds that nephrectomy is justified only when the capsule of the kidney is not affected.

Of 20 tumors studied microscopically 8 appeared benign. Five of these patients are living and 2 died from other diseases. One had a recurrence ten years after the operation. Nine of the tumors proved to be malignant. Four of these patients died from recurrence and 2 died following the operation. In 3 instances death was due to other causes. In the unclassified cases there were 3 deaths from recurrence, 1 following operation and 2 from other causes.

KORITZINSKY (Z).

**Penfield, W. G.: Contraction Waves in the Normal and Hydronephrotic Ureter: An Experimental Study.** *Am. J. M. Sc.*, 1920, clx, 36.

In his experimental work Penfield aimed at incomplete ligation of the ureter for the following reasons:

1. The resultant hydronephrosis developed more slowly but was greater in degree.

2. The resultant condition more nearly resembled clinical hydronephrosis, which usually is due to a partial or recurring obstruction.

3. Such ligation very seldom caused atrophy of the kidney which almost always follows complete ligation.

Under strictly aseptic conditions a small ventral incision was made in a rabbit or dog, a rubber band of small caliber was fastened about one ureter just above the bladder to produce partial obstruction, and the abdomen was then closed.

After periods varying from three weeks to five months the animals were again anesthetized, the abdomen was opened, the rectum was cut across at its lowest point, the intestines were reflected upward, and both ureters were exposed for their entire length. Following this exposure the specimen was placed under glass in a chamber maintained at a temperature of 38 degrees C.

After observation *in vivo* both normal and hydronephrotic ureters were removed from the animal and placed in oxygenated Lock's solution at 38 degrees C. Experiments were performed on the ureters during the succeeding twelve hours. The whole ureter was preserved intact. The contractions of a ring segment about 1 cm. long at either end of a ureter were recorded by means of loops of fine silk which were passed through the ureteral wall and out at the end of the ureter, and thus included a ring of circular muscle. These segments were connected with light, balanced writing levers which registered on a smoked drum. By this means records were obtained of the beginning and the end of a wave of peristalsis or retroperistalsis and the time required for the passage of the wave.

The conclusions arrived at as a result of these experiments are as follows:

1. The ureter is a muscular tube which, when subjected to partial obstruction, always dilates, usually hypertrophies, and shows an increase in its peristaltic rate.

2. Contraction waves pass in either direction with equal facility, their speed depending on the location of the area in which the spontaneous contraction is most rapid. This area is normally in the renal pelvis, but under abnormal conditions a more rapid pacemaker may be established elsewhere.

3. The formation of a contraction ring which becomes pacemaker for the ureter above and below it depends on three factors: the metabolic gradient, ureteral distention, and refractoriness during contraction and the first part of relaxation.

4. It is suggested that in the passage of a ureteral stone, trauma and inflammation increase the rate of metabolism in the ureteral wall about the stone, a constriction ring forms, and distention of the ureter and retroperistalsis follow. This would cause great distention of the renal pelvis and explain the peculiar rhythmic character of renal colic.

JOHN P. O'NEIL.

#### BLADDER, URETHRA, AND PENIS

**Notkin, S. J.: The Bladder Epithelium in Man** (Ueber das Harnblasenepithel des Menschen). *Anat. Hefte*, 1920, lviii, 423.

In his discussion of the structure of the epithelium of the urinary bladder in man Notkin refers to the theory of Berndorf. According to Berndorf's theory the epithelium consists of only two layers of cells. As a result of extensive investigations Notkin has come to the conclusion that while this is true in most cases, there are many exceptions to the rule. Various factors influence the number of layers. For example, in certain cases of dilatation of the bladder the number is found to be decreased, while in certain cases of proliferation it is increased.

DENCKS (Z).

**Kolischer, G.: What Should We Do with Bladder Tumors?** *Illinois M. J.*, 1920, xxxviii, 21.

For benign tumors of the bladder the author advocates either fulguration or galvanocauterization followed by the use of radio-active substances. He feels that the tendency of papillomata to recur rapidly after excision by the knife contra-indicates excision.

Fulguration is effective if the papilloma is truly benign, but as it is so difficult to determine whether it is benign the use of the galvanocautery followed by radium is safer if there is any reason to suspect malignancy.

The author is convinced that the radical surgical excision of malignant bladder tumors has failed as the primary mortality is high, the convalescence is tedious and painful, and the procedure is followed by early recurrence.

Kolischer believes that the bladder should be opened for drainage and for the treatment of urosepsis, hæmorrhage, or uncontrollable spasm. Through the widely opened bladder the growth may be treated by diathermy (electrocoagulation) which permits exact application and dosage. Such treatment seals off the lymphatics, stops hæmorrhage and pain, and is the most efficient means of combating malignant growths. The author always supplements this treatment with radiotherapy.

HENRY L. SANFORD.

**Geraghty, J. T.: The Value of Radium in the Treatment of Bladder Tumors.** *South. M. J.*, 1920, xiii, 511.

Before 1910 the only method of treating bladder tumors was excision by operation. Recurrences were frequent, especially in cases of benign papilloma as transplantation occurred at the time of operation. In the records of the Hopkins Clinic up to 1910 Geraghty was able to find only one cure after the removal of a papilloma by operation. Since the introduction of fulguration, however, only one case of papilloma has been treated by operation.

Vesical tumors which respond most readily to fulguration are the benign papillomata. Those which do not respond to this treatment or are made worse by it are papillary carcinomata. In an intermediate group are tumors which clear up quickly after fulguration, and others which approach in their resistance the true papillary carcinoma.

Geraghty classifies bladder tumors as follows:

In the benign papilloma the connective tissue axis is covered by an epithelial structure identical with the bladder mucosa. In malignant papilloma the malignant changes are confined to the epithelium alone, there being no evidence of invasion of the connective-tissue framework. In a papillary carcinoma the epithelium breaks through the basement membrane, invading the axis of the papilla, its main stalk, or the bladder wall itself.

Geraghty has studied 170 cases of bladder tumor, 79 of which were papillomata (benign or malignant); 90, papillary carcinoma which infiltrated the bladder wall; and 1, a basal-cell carcinoma.

All papillomata, benign or malignant, respond to vigorous radiation with radium. The more malignant the growth the greater the amount of radiation that is necessary. When extensive infiltration has taken place it is impossible to cause the complete disappearance of the tumor with radium.

In treating the malignant type of papilloma Geraghty has observed that those which are resistant to fulguration are easily destroyed by fulguration after they have been radiated.

As early papillary carcinomata are stimulated to growth by fulguration, radium alone is used except when there has been extensive infiltration of the bladder. Geraghty's routine is to radiate all papillary tumors except those which are benign, in which fulguration effects a cure. Between 103 and 210 mg. of radium element are used. The radium is

applied with a specially built cystoscope which is held in place by means of a mechanical arm attached to the table. The bladder should be moderately distended with water. Radiation is given for one hour, one to three times per week, depending upon the size of the tumor and the reaction.

A differential diagnosis between benign and malignant papillomata is not of great clinical importance as the great majority of the malignant type respond to fulguration. The differential diagnosis between papillary carcinoma and papilloma, however, is essential as fulguration fails in cases of papillary carcinoma.

In the author's experience it is frequently possible to distinguish papilloma from the papillary carcinoma by means of the cystoscope, but a differentiation between a malignant and a non-malignant papilloma cannot be made from the cystoscopic findings alone unless the malignancy has advanced so that infiltration in the bladder wall has taken place. Necrosis is indicative of carcinoma. In advanced malignancy the tumor or the bullæ around its margins usually indicate cancerous invasion of the bladder wall. Small tumor nodules seen beyond the main growth are indicative of cancer.

Geraghty finds palpation of value in the diagnosis as the tumors involve the posterior bladder and when infiltration has taken place the induration can be felt.

Excision of tissue is done only occasionally as other methods are usually sufficient. In many instances a bit of tissue may not indicate the malignant nature of the tumor, although cancer cells may be present in other parts of the growth.

The presence of a severe intractable cystitis associated with a bladder tumor is strong evidence in favor of the presence of an infiltrating neoplasm.

Geraghty draws the following conclusions:

While benign and malignant papillomata and the early papillary carcinoma disappear under the influence of radium, the infiltrating types are very resistant to this agent. Therefore, when the infiltrating character of the growth has been determined and the tumor is sufficiently localized so that it can be removed completely a radical resection is indicated. Following the removal of an infiltrating papillary carcinoma, cystoscopy should be done at an early date as recurrences, which are not infrequent, will often yield promptly to radium, notwithstanding the resistance of the primary tumor. It is of interest to note that the use of radium has not diminished the tendency of bladder tumors to recur, recurrences being observed in about 30 per cent of the cases treated.

Radium has proved to be a valuable aid in the treatment of bladder tumors, and while the results obtained in the infiltrating types are far from satisfactory, an improved technique whereby more intensive radiation may be given safely, may offer a more encouraging outlook in the future.

GILBERT J. THOMAS.



**Timberlake, G.: A Simple and Efficient Means of Applying Radium to Bladder Neoplasms in the Male.** *J. Am. M. Ass.*, 1920, lxxv, 309.

While working with Young's cystoscopic rongeur the author found that this instrument may be used for the direct application of a radium capsule to intravesical growths. The capsule is held firmly in the jaws of the instrument by a pulley belt hook slipped over the thumb and finger posts. After it has been accurately placed the cystoscope is removed and the obturator introduced in order to prevent leakage.

Regardless of the position of the tumor mass, it can be approached in this way with reasonable accuracy and the dose may be varied with each treatment according to the requirements. The discomfort to the patient is minimized as the time necessary for the application is lessened.

HARRY A. FOWLER.

**Lydston, G. F.: Urethral Strictures of Large Caliber, a Much Neglected Field.** *Am. Med.*, 1920, n. s. xv, 312.

The author calls attention to a class of cases in which there is a chronic urethral discharge due to stricture of large caliber. This type of stricture is often undiagnosed because it will admit sounds of comparatively large size with little resistance. When a bulbous bougie of smaller size is used, however, very distinct resistance is felt at the point of narrowing.

Some cases of this sort are permanently cured by dilatation, but in the author's opinion urethrotomy, either external or internal, according to the location of the stricture, is the only measure which can be expected to give lasting results when a fibrous ring is present.

H. L. SANFORD.

## GENITAL ORGANS

**Kinoshita, M.: The Lipoids of the Prostate** (Die Lipide der Prostata). *Ztschr. f. Urol.*, 1920, xiv, 145.

The findings of different investigators regarding the lipoids in the normal prostate vary considerably. Kinoshita examined for fat 85 prostates taken at random, among them the prostate of an infant 19 days old and that of a man 84 years old.

In the prostates of children a lipid granule is to be found in almost every epithelial cell, while in those of boys at the age of puberty the individual glands are increased in size and number and the fat content of the epithelial cells varies. The prostate is fully developed at about the nineteenth year of age. After the twentieth year it contains a greater amount of fat. The maximum is reached at about the thirtieth year and then decreases.

The distribution of fat follows fixed laws. At about the time of puberty the lipoids appear chiefly in the glands of the colliculus and the large efferent ducts. Later they become more widespread, the smaller lipid substances being found in the per-

iphery of the prostate as well as in the central part. After the second half of the fifth decade of life the colliculum contains fewer lipid substances, while the rest of the gland contains more. In the individual cells they are found as a rule at the base, underneath the nucleus. In some cases they fill the entire cell and the cells assume a shorter cubical shape on account of the large number of variously formed granules.

Kinoshita believes that any inflammation which impairs the physiological function of the prostate causes a decrease in its fat content. The increase in the lipoids at puberty and the decrease in old age seem well established. The appearance of the fat follows about the same course as the development of the prostate itself.

In the prostates of oxen, dogs, and smaller animals the lipid content differs materially from that in the human prostate. The lipoids in the human prostate which stain with Sudan III appear to be a physiological product. In this connection the question arises whether they are a secretion of normal cells, assimilated products of cellular activity, or part of an internal secretion. Having weighed all the theories suggested, the author has come to the conclusion that the fat of the prostatic epithelium is not a secretory product but the assimilated substance of cellular activity which perhaps is combined with an internal secretion. This view is held also by Herxheimer.

In addition to the findings mentioned, Kinoshita discovered also in the basal layer of the two-layered epithelium of the prostate single large vacuolated cells containing a substance which stains with Sudan III. These may be subepithelial connective tissue cells which, especially in the normal prostate of the reproductive male, have invaded the epithelium. In Kinoshita's opinion they are of connective tissue origin and have phagocytic power. Here and there, but mostly about the colliculus and the excretory ducts, refractive lipoids, larger than the other lipid bodies, are also to be found. After the age of 40 these increase in size and number and are most abundant in the aged, often appearing in the desquamated, degenerated, and fatty epithelium of the lumen. They are to be found also irregularly distributed in hypertrophied prostates. Heat causes the refraction to disappear, but on cooling it reappears. These refractive bodies are especially abundant in the prostates of dogs and are believed to be related in some manner to reduced, abnormal cellular function.

The article contains a summary of the findings arranged in tabular form and a colored plate showing the microscopic picture.

JANSSEN (Z).

**Bugbee, H. B.: Prostatectomy.** *Boston M. & S. J.*, 1920, clxxxiii, 41, 80.

Bugbee describes the history of the various methods employed to relieve obstruction due to so-called prostatic hypertrophy, both *per urethram* and by open operation.



The most important step is the diagnosis of the lesion and the relief of the urgent symptoms. The intravesical surface of the prostate as well as the wall of the bladder should be studied whenever it is possible to pass an instrument. In this regard the author differs from Braasch, who gives a limited number of indications for the examination. Bugbee claims we must be on guard against a tendency to place patients in certain classes with respect to treatment as such a classification means group handling, which does not take into consideration the requirements of the individual case.

The first step in the treatment is the elimination of stone, tumor, and nerve lesions. When this has been done, the second step is operation if the patient's condition is favorable. If operation is contra-indicated, measures for the relief of absorption and kidney insufficiency should be instituted so that a complete removal may be done at a later date.

In very many cases congestion plays a very important part, and when this condition is relieved little if any true hypertrophy remains. It is in such cases especially that operation should not be performed unless indicated definitely.

In a series of 147 of the author's cases there were 3 deaths. Incontinence resulted in 3 instances in which an operation by the perineal route was done, a perineal fistula persisted in 2, and nodules of the prostate were left about the vesical neck in 2 others. In 1 case in which a one-stage suprapubic prostatectomy was done death resulted from hæmorrhage which occurred during continuous irrigation, and in another, from renal insufficiency. In 1 of the cases treated by a two-stage operation death was due to uræmia.

The author has treated a large number of prostatic cases by palliative measures, and in early or borderline cases—cases of slight hypertrophy, carcinoma, and partial obstruction due to a small amount of tissue—he has used fulguration. While he does not advocate the same operation for all cases, he believes that the suprapubic two-stage prostatectomy is the safest, is based on the best principles from the anatomical, physiological, and pathological standpoints, involves fewer complications, and gives the best functional results.

In every case he uses at operation a Hagner bag or a Pilcher modification of it to prevent bleeding. The large drainage tube is removed twenty-four hours later. Traction on the bag is maintained up to twelve hours. It is then emptied and allowed to remain in position so that it will be available if bleeding takes place again. Following the operation the patient is placed upon fluids at once and salines are given by rectum at frequent intervals. The average time for closure of the wound is twelve days. The catheter is retained in the urethra for two days after the wound has stopped draining in order to insure a tight closure. Elevation of the scrotum throughout is important to prevent epididymitis.

Bugbee would limit perineal prostatectomies to suppurative prostates not permitting preliminary

drainage, prostatic calculi, and those few cases of malignancy which warrant operation and in which the malignancy begins in the posterior lobe which cannot be reached from above. LOUIS GROSS.

**Deavor, T. L.: The After-Care in Suprapubic Prostatectomy; Some New Features. *Am. J. Surg.*, 1920, xxxiv, 181.**

Deavor enumerates the various points in favor of both the suprapubic and the perineal prostatectomy, making these comparisons to bring out more fully the special features which should be recommended in the postoperative treatment. From the standpoint of mortality, prompt recovery, final results, and general satisfaction on the part of the patient the suprapubic operation is preferred.

The author drains by gravity and always uses the largest catheter as he claims that the better the drainage through the urethra, the more quickly will the suprapubic wound close. He advises against the use of self-retaining catheters. A small meatus should be enlarged, and a stricture divided or divulsed to admit easily a 32 F. sound which will open the way for the larger catheter. Deavor drains through the urethra and the suprapubic wound, closing the bladder tightly by a purse-string suture. He employs the "drip apparatus" for continuous drainage and flushes the bladder at frequent intervals, using ice-cold boric acid solution when the patient's condition will permit it to check postoperative oozing and for its soothing effect. If clots form he draws them out by suction through the catheter or the suprapubic tube. During the period of drainage he changes from soda to saline and then back again to the boric acid solution as these changes prevent the incrustation of urinary salts around the catheter.

The upper tube is removed in from two to four days and a cut-off is applied to the catheter to be released by the patient himself every half hour for urination. The period of retention is then gradually lengthened and the suprapubic wound is strapped for more rapid closure.

The author insists that as a rule patients are dismissed too early. In the majority of cases positive signs of improvement will be noted if the postoperative treatment is faithfully carried out, especially as regards the smaller details which are so often overlooked. LOUIS GROSS.

**Stanley, L. L.: Experience in Testicle Transplantation. *California State J. Med.*, 1920, xviii, 250.**

During the past two years 11 men have been operated upon at San Quentin prison for the implantation of human testes taken from recently executed convicts. In the past four months 21 transplantations have been made with testicular material taken from young rams.

Details as to the site of the implantation, the amount of transplant used, and the results obtained in each case are given.



That the implantation of testicular material had a stimulating and invigorating effect upon the recipient sexually as well as mentally and physically was evident in all instances.

The implant did not live but became necrotic in a short time. In this process of necrosis, however, it seemed evident that certain unknown substances were released into the system. The glands of rams seemed to be as effective as human glands.

The glands for implantation may be preserved for a week or longer by immersion in vaseline and freezing.

In the operations reported the implant seemed less apt to slough out when placed in the abdomen than when placed in the scrotum. When it was implanted in the abdomen the patient was obliged to remain in bed only one day.

The author claims that any means which increases the physical well-being as this process does tends to increase longevity. CARL R. STEINKE.

#### MISCELLANEOUS

Chute, A. L.: *The Significance of Hæmaturia; A Study of 100 Personal Cases.* *Boston M. & S. J.*, 1920, clxxxii, 623.

Most of the 100 cases upon which this article is based were consecutive. Cases of hæmaturia due to injury were not included.

To determine the source and cause of the bleeding the use of instruments of precision is necessary in

all but the most simple cases, whether the hæmaturia is in the initial or terminal stages, painless or painful, constant or intermittent. The greatest aid in this problem is the cystoscope. In a large proportion of cases of bleeding lesions of the kidney pyelography will be necessary to determine the cause.

The author's cases included the following conditions: infiltrating growths of the bladder, 32 cases; massive papillomata of the bladder, 11 cases; small papillomata of the bladder, 7 cases; hypernephromata, 8 cases; prostate, benign, 7 cases; prostate, malignant, 6 cases; nephritis, 7 cases; renal tuberculosis, 5 cases; hydronephrosis, 3 cases; stone in kidney, 4 cases; stone in ureter, 3 cases; stone in prostate, 1 case; Banti's disease, 3 cases; polycystic kidney, 1 case; diverticulum of the bladder, 1 case; and papillary cystitis, 1 case.

In 64 per cent of these cases the hæmaturia was due to new growths. Such conditions require immediate care. The various treatments used by the author in cases of bladder tumors are discussed in detail. Cases of ureteral stone he treats conservatively unless the calculus is incarcerated.

In conclusion Chute says: "My opinion is that a study of a considerable number of cases of hæmaturia compels us to conclude that the physician who told his patient that he might safely ignore his bleeding showed poor judgment medically; that although he was partially right, this was due to good luck rather than to sound medical judgment."

H. L. KRETSCHMER.

# SURGERY OF THE EYE AND EAR

## EYE

**Hardy, W. F.: The Reactions of the Ocular Apparatus to Syphilis.** *Am. J. Syphilis*, 1920, iv, 438.

Hardy classifies the syphilitic reactions of the eyes into the inflammatory and degenerative types. All of the latter apparently are intra- or extra-ocular nerve lesions. In the former there are acute and chronic manifestations which may affect single parts of the eye or the whole eye. The disease may begin before birth, when it involves principally the uveal tissues, or it may come on congenitally as late as puberty, when interstitial keratitis is often seen.

The author gives statistics regarding chancres of the lid and bulb. Those of the lachrymal apparatus are infrequent but later manifestations causing "saddle nose" interfere with the drainage and predispose to dacryocystitis.

Taking the tissues of the eye in order, Hardy mentions the most frequent findings in secondary and tertiary lesions, including the paralyses of the ocular nerves. As complications he mentions glaucoma, cataract, and retinal detachment. Primary syphilitic atrophy of the eye does not occur. In the diagnosis the usual symptoms and signs such as Hutchinson's teeth, rhagades, tophi, enlarged lymphatic glands, arthritis, and deafness must not be overlooked.

THOMAS D. ALLEN.

## EAR

**Hays, H. M.: The Relation of Hypertension and Hypotension of the Membrana Tympani to Deafness and Tinnitus.** *N. York M. J.*, 1920, cxi, 1067.

Hays makes a plea for a closer study and classification of cases of deafness and tinnitus so that the treatment may be more scientific. A case should be studied to determine whether the drum is in a state of hypertension or hypotension. The proper treatment for one type is detrimental to the other. The contributing factors underlying the condition must then be determined and treated intelligently. Such factors are diseased posterior tips of the inferior turbinates, diseased or buried teeth, and abnormal conditions of Rosenmuller's fossa, the tubal orifice, and the tube proper.

O. M. ROTT.

**Pattee, J. J.: Misleading Conditions in Acute Suppurative Otitis Media.** *Colorado Med.*, 1920, xvii, 180.

In discussing the conditions which sometimes complicate the diagnosis in acute suppurative otitis media the author calls attention especially to the fact that extensive caries and bone destruction may

be present without elevation of the temperature and without tenderness. If the streptococcus capsulatus is found, operation is indicated in spite of the absence of the clinical signs of fever, tenderness, and pain. Occasionally otitis externa simulates mastoiditis so closely that only the functional tests and skiagram will clear up the diagnosis.

Two types of postauricular swelling are mentioned. One of these, which occurs just behind the auricle in children, is generally recognized and operated upon, but the other, which occurs in adults more posteriorly in the region of the emissary vein, is more urgent. In the second type there is induration, but no fluctuation as in the first type. The condition occurs in chronic cases and frequently is a sign of extensive pathologic changes in the region of the sinus or brain.

A copious discharge should not be regarded as favorable as in such cases the mastoid is involved. If the copious discharge continues beyond the third or fourth week, operation is the safest procedure.

OTTO M. ROTT.

**Young, G.: Preventive Mastoidotomy.** *Glasgow M. J.*, 1920, n. s. xii, 43.

The author urges early operative interference in suppurative otitis media, both acute and chronic, because of the dangers of death, deafness, or chronic ill-health. Non-operative treatment should not be continued longer than one month. For the acute condition either the Schwartze operation or the modified radical operation should be done. In chronic cases the conservative operation is indicated when the conversational voice can be heard with the affected ear at a distance of more than 3 ft.; the radical operation, when the conversational voice can be heard with the affected ear only at a distance of less than 3 ft.; and the modified operation, when both ears are diseased, unless hearing in the affected ear is negligible.

Exceptions to these indications are cases of cholesteatoma, infection by the tubercle bacillus or Vincent's spirillum, or recurring polypi. These should be treated by the radical operation.

OTTO M. ROTT.

**Muecke, F. F., and Hill, C. G.: Symptomless Influenzal (Streptococcal) Mastoiditis.** *Lancet*, 1920, cxcix, 241.

Numerous complications from very acute influenzal mastoiditis, such as lateral sinus thrombosis, perisinus abscess, and extradural abscess, are described as appearing without the usual signs or symptoms of mastoiditis. The characteristic features in these cases in the early stages are the same as those of the ordinary streptococcal ear,



namely, pain, fever, malaise, coryza, and general aches and pains. The upper part of the drum is red and bulging from the beginning. Perforation occurs early with a thin hæmorrhagic discharge and complete relief of pain. The posterior meatal wall is red and swollen. The discharge becomes profuse the second or third day. After perforation, there is no pain, fever, or malaise, or even mastoid tenderness. Operation performed when the findings mentioned were noted always revealed soft red bone with cavities filled with pus. Hæmolytic streptococci were found in all instances.

The patients observed by the author were divided into three groups. In Class A were patients seen late in the course of the disease with complications found at operation. Class B included patients seen shortly after the onset of the condition and operated on before the onset of complications. Class C was made up of patients seen from the onset in whom complications were prevented.

Emphasis is laid on the importance of the only sign constantly present; that is, the redness and swelling of the upper drum and posterosuperior meatal wall and continuance or increase of the aural discharge. If the patients in Class C had not been operated on at the onset they would have run the risk of following the same course as those in Class A.

W. H. GREENFIELD.

**Chavanne, F.: Rupture of the Tympanum from Shell Explosions.** *Laryngoscope*, 1920, xxx, 441.

Rupture of the tympanum from shell explosions or detonations is frequently complicated by acute purulent otitis media. This condition is dependent upon the size of the rupture, unfavorable conditions of cold and humidity, the presence of concomitant nasopharyngeal infection, and external infection. The author reports 543 personal cases.

Tympanic ruptures may be very extensive. In form they are usually more or less circular or linear. Linear ruptures occurred in more than one-half of the author's cases (337). There were 11

instances of punctiform rupture and 7 of almost complete rupture.

In 258 cases the rupture occurred below and in front, in a position corresponding to that of the figure seven on the face of a clock. In almost all of the cases linear rupture was vertical in direction or slightly oblique. It was horizontal in only 1 instance.

Tympanic ruptures complicated by acute purulent otitis media often become cured without the development of any other complication. The author has seen only 11 cases complicated by mastoiditis.

Thirty-five of the author's acute purulent cases became chronic.

SPENCER S. HOWE.

**Atkinson, D. T.: Modern Technique of the Tympanomastoid Operation.** *Internat. J. Surg.*, 1920, xxxiii, 211.

Atkinson describes the steps in the technique of the radical mastoid operation as follows:

1. An incision is made through the skin and periosteum, extending from below upward.
2. The edges of the wound are retracted and the periosteum is elevated.
3. The antrum is opened with a chisel and curette and then entirely rimmed out with the curette and freed from all necrosed bone, cholesteatoma, granulations, polypi, or debris.
4. The mastoid cells are completely obliterated with the gouge, curette, and rongeur forceps.
5. The covering of the aditus ad antrum is removed, preferably with the Kerrison forceps.
6. The posterior wall of the meatus is lowered.
7. The malleus and incus are removed and the tympanic cavity is freed from all inspissated pus, granulations, or necrosed bone by means of a curette.
8. The wound is irrigated and cleansed.
9. Flaps are made by Pause's technique.
10. Skin grafts may or may not be used.
11. The wound is dressed with gauze strips which are allowed to remain in place for four or five days.

The postauricular wound is not closed at the time of the primary operation. OTTO M. ROTT.

# SURGERY OF THE NOSE, THROAT, AND MOUTH

## NOSE

**Klemptner, L.: An Original Method of Submucous Operation on the Septum.** *Ann. Otol., Rhinol. & Laryngol.*, 1920, xxix, 447.

After making the incision through the mucosa on the convex side and elevating it, the author makes an incision through the cartilage of the other nostril  $\frac{1}{2}$  in. back of the first incision on the opposite side. As the mucosa of the opposite side has already been elevated, there is no danger of perforation during the incision of the cartilage. OTTO M. ROTT.

**Mullin, W. V.: Indifference of the Laryngologist toward Tuberculous Laryngitis and the Tuberculosis Problem.** *J. Am. M. Ass.*, 1920, lxxv, 30.

The author draws the following conclusions:

1. A more active interest in tuberculosis should be taken by laryngologists.

2. There should be more thorough and uniform teaching of the subject. This instruction should be carried on in such a way that the student will have an opportunity to examine large numbers of incipient cases and to see them repeatedly so that he may familiarize himself with the laryngeal image observed in tuberculosis as compared with that seen in other allied conditions.

3. A committee of laryngologists representing the various laryngological societies should be formed to meet with a committee from the National Association for the Study and Prevention of Tuberculosis for the purpose of standardizing the literature and instruction regarding the disease and to stimulate clinical investigations and pathologic research. OTTO M. ROTT.

**Briggs, H. H.: Roentgenography and Transillumination: Comparative Value in the Diagnosis of Diseases of the Frontal and Maxillary Sinuses; Author's Method of Transillumination.** *J. Am. M. Ass.*, 1920, lxxv, 298.

The roentgenogram outlines the sinus better than transillumination and offers definite limits to guide the operator. It alone furnishes positive evidence of the absence of a frontal sinus, as the shadow seen in transillumination might indicate an infected sinus. On the other hand the rays making the plate must pass through the head and consequently the plate may contain misleading shadows caused by many parts within the cranium posterior to the sinuses. The translucency of a sinus is little interfered with by extraneous parts except by slight variations of thickness in the bony walls and overlying soft tissues. Transillumination requires less skill and may be quickly and inexpensively done by the clinician himself, while the roentgenogram correctly

made is the product of a rather highly specialized and therefore expensive technician and requires careful interpretation.

The author prefers the nose-chin position in which the shadows from the lesser wings of the sphenoid and the petrous portions of the temporal bone fall on the plate outside the projection of the sinus to be roentgenographed.

In transillumination of the maxillary antrum Briggs passes the light from above through the orbital plate and observes the light from the palatal and buccal surface.

The advantages claimed for this method are: (1) the light passes through less extraneous tissue and through opposite instead of adjacent sides; (2) it takes less time; and (3) it is more cleanly. OTTO M. ROTT.

**Mayer, E., Skillern, R. H., and Sonnenschein, R.: Anæsthesia in Nose and Throat Work: Abstract of the Report of the Committee on the Advantages and Disadvantages of Various Local Anæsthetics.** *J. Am. M. Ass.*, 1920, lxxv, 315.

The purposes of this study were as follows:

1. To compare local anæsthesia and its effects with general anæsthesia.

2. To check laboratory data by clinical data.

3. To ascertain what clinical literature offers in support of the use of the several local anæsthetics in different conditions and the use of concentrated solutions rather than dilute in any case.

4. To determine what cases show idiosyncrasy, with a view to determining the causes.

5. To ascertain the relative merits of cocaine and the synthetic products.

6. To determine whether or not hæmorrhage during or after operation is greater under local than under general anæsthesia.

7. To study the toxicity, noting especially injuries to the mucous membrane.

8. To note the effects of the previous administration of morphine in reducing the danger of toxicity and in adding to the patient's comfort.

9. To compare the effects of local and general anæsthesia and to make such recommendations as might be deemed advisable.

The findings of the investigation are summarized as follows:

1. There is a remarkable similarity in the clinical effects and animal experimentation.

2. None of the synthetic products equals cocaine in its local effect when applied to the mucous membrane.

3. The synthetic products may be freely injected in proper doses in unlimited quantities if the injection is given slowly.



4. Fatalities occur immediately or not at all.
5. The drug is eliminated in the liver.
6. The greatest danger lies in giving the injection too rapidly or entering a vein.

7. In some cases a peculiar susceptibility which may be termed an idiosyncrasy is noted in the fact that the drug enters the circulation so rapidly that death occurs almost immediately.

8. A further study of the toxicity of the local anesthetics will establish the causes of death.

9. Local anesthesia is undoubtedly the choice of all American rhinologists for operations on the nose.

10. It is the choice also of a very large proportion of American laryngologists for throat operations.

11. A small number of surgeons believe that tonsil operations in particular are best performed under general anesthesia.

12. The dangers of hæmorrhage during tonsil operations under local anesthesia are no greater than those under general anesthesia.

13. There is no greater danger from postoperative hæmorrhage under local than under general anesthesia.

14. The previous administration of morphine requires further investigation.

The conclusions drawn from the investigations are that:

1. Local anesthesia is the ideal method in operations for affections of the nose and throat.

2. None of the dangers that have been mentioned is any greater than those following general anesthesia.

The authors make the following recommendations:

1. The formation of a permanent committee on toxicity following local anesthesia.

2. Clinical investigation of new local anesthetics by clinicians of our own choosing as soon as the pharmacologist has made his investigation.

3. The use of soluble tablets of cocaine to make fresh quantities of the solution as required, one tablet to be dissolved by the operator in hot sterile water. Each 240 minims of this solution should make a 0.5 per cent solution. The unnecessary deaths which are ascribed to the mistake of the druggist or the nurse would thus be avoided.

OTTO M. ROTT.

**Gording, R.: Serious Complications in the Puncture of the Maxillary Antrum; Investigations, by Experiments on Animals, of the Reflexes Produced from the Mucous Membrane of the Antrum; Air Emboli after Antrum Puncture.** *Ann. Otol., Rhinol. & Laryngol.*, 1920, xxix, 293.

Following a review of cases from the literature, his own practice, and the practice of his colleagues in which puncture of the maxillary antrum was associated with serious complications, the author discusses the various factors responsible for such complications.

Cocaine poisoning may be a predisposing cause but scarcely the decisive factor. Two other possible factors are a reflex of unknown nature from the

mucous membrane of the antrum or the production of an air embolus during the operation. Regarding these possibilities Gording reaches the following conclusions:

1. While it cannot be denied that reflex irritation phenomena may occur in sensitive persons, such phenomena are rare.

2. Air emboli may arise from the loosening of the membrane lining the antrum and the injection of air between the bony wall and the membrane. This, of course, is not true in all cases and in many no satisfactory explanation can be offered.

The author sums up his observations as follows:

1. Serious symptoms are rare but are fraught with the greatest danger to life.

2. There are two factors which should be taken into consideration in puncture of the antrum: (1) the narrow stenosed ostium maxillare; and (2) the thick, firm antral wall.

3. If the ostium maxillare, notwithstanding the usual cocaineization, is stenosed so that the advance of the air through the ostium is impeded, the opening in the lower meatus, especially in the more acute sinusitis with tenderness of the mucous membrane, should be made sufficiently large for the air and water to pass through it without too greatly increasing the pressure in the antrum.

4. If the wall of the lower meatus is thick and offers such resistance to the insertion of the trocar that the needle is able to penetrate the bony wall only very gradually, it would perhaps be safest to withdraw the needle and choose the way through the middle meatus. If for some reason it is nevertheless considered desirable to use the trocar through the lower meatus, the utmost caution must be exercised, as under these conditions it is impossible to be certain that the mucous membrane has not been loosened. In such cases it might be better not to give an injection of air, but to endeavor to make the diagnosis by aspiration if a large opening is not made at once.

OTTO M. ROTT.

**Skilern, R. H.: A New or Hitherto Undescribed Form of Maxillary Sinusitis.** *Ann. Otol., Rhinol. & Laryngol.*, 1920, xxix, 437.

In the case reported the chief complaint was of a postnasal discharge of liver-like clots of blood. There were no signs or symptoms of inflammation, and no pus was discovered. When the antrum was washed out an ounce or more of apparently pure unclotted blood escaped but no pus. Bacteriological examination of the blood revealed large numbers of hæmolytic streptococci. Following daily irrigation the discharge began to assume a purulent type, but reverted to the hæmorrhagic type when treatment was discontinued.

OTTO M. ROTT.

**Sullivan, J. J., Jr.: Conservative Operation of the Nasal Accessory Sinuses.** *Pennsylvania M. J.*, 1920, xxiii, 581.

A diagnosis of sinusitis should not be based merely upon the presence of pus in the nose nor should it

be assumed that sinusitis is not present if pus is not found.

The following routine examination is advocated by the author:

1. Examine the nose before and after the use of cocaine and epinephrin.
2. Syringe the nose with normal salt solution, collecting the fluid in a black pus basin.
3. Transilluminate the nose with the author's frontal sinus and antrum light, beginning low on the rheostat and gradually increasing the light.
4. Make a roentgen-ray picture and compare it with the transillumination markings of the sinus.
5. Place the patient in Escat's position.
6. Puncture and irrigate the maxillary sinus and search for thickened membrane, etc. with a probe passed through the puncture opening.
7. Cocainize and infract the middle concha with a blunt elevator or Killian's long spatula to examine the ethmoid and frontal sinuses. Examine for thickened membrane with a probe. Probe the frontal sinus gently and wash it out if there is any suspicion of disease.
8. If it is impossible to differentiate between disease of the posterior ethmoid cells and the sphenoid remove the obstructing septum or middle turbinate in order that probing may be done for the sphenoid sinus opening.
9. Use suction on all sinuses.

The author emphasizes especially the importance of infraction rather than removal of the middle concha, enlargement of normal openings, frequent washings, the use of the suction apparatus, and drainage with the least possible destruction of the anatomical structures of the nose. SPENCER S. HOWE.

**Anglade and Philip: Glioma of the Nasal Fossæ**  
(Le gliome des fosses nasales). *Presse méd.*, Par., 1920, xxvii, 464.

Although the nasal fossæ are in the immediate vicinity of the central nervous system, they are seldom the seat of neoplasms of nerve origin. The authors report the case of an infant three days old who had a tumor in the upper part of the right nasal fossa. On the left side respiration was difficult because of deviation of the septum caused by the growth. At operation a tumor the size of a kidney bean was removed. A recurrence then developed but disappeared after applications of radium.

The tumor was kidney shaped and its pedicle corresponded to the renal hilum. The convex side was covered by the nasal mucosa. Examination showed the growth to be a pure glioma but there was no trace of sarcomatous change. Marked vascularization was noted in the vicinity of the hilum and the neuroglia formation was remarkable.

That the tumor was a true neoplasm rather than a cerebral hernia is indicated by the fact that a hernia of the brain in a very young child is not capable of showing the histologic structure of a glioma as neuroglia is very rare if not entirely absent on the cortex of the brain of the new-born.

The authors have been able to find only 4 cases of glioma of the nose in the literature. Two of these were reported by American authors. Glioma of the nasal fossæ, therefore, would seem to be a very rare tumor, but in the authors' opinion it occurs more frequently than is generally supposed.

WILLIAM A. BRENNAN

**Roy, D.: A Case of Sarcoma of the Nasopharynx with Some Interesting Features.** *Ann. Otol., Rhinol. & Laryngol.*, 1920, xxix, 366.

The case of sarcoma reported was subjected to radium therapy. The size of the tumor was reduced two-thirds but death occurred from a general sarcomatous toxæmia. This patient also presented a two-plus Wassermann reaction and had received anti-leptic treatment for some time. The author is of the opinion that in cases of this type radium therapy is past the experimental stage and that the results in the case reported would have been better if the growth had not penetrated into the vascular region of the ethmoid cells.

The prognosis of sarcoma of the nasal cavities and nasopharynx is most unfavorable. The author has treated 8 cases, using every known method—operative treatment, electropuncture, Coley's fluid, radium, ligation of the carotids, etc.—but death resulted in every instance.

From a review of the literature on the different methods of treatment Roy finds that the best results have been obtained by the use of the X-ray and radium, especially radium. OTTO M. ROTT.

## THROAT

**Cullom, M. M.: The Technique of Tonsillectomy under Local Anæsthesia.** *Laryngoscope*, 1920, xxx, 419.

Cullom discusses three considerations in the removal of the tonsils: (1) thoroughness, (2) painlessness, and (3) speed.

Thoroughness is obtained by careful dissection. Pain is prevented by swabbing the throat with an 8 per cent solution of cocaine and injecting 15 ccm. of a ½ per cent solution of apothecin to which 6 drops of adrenalin solution (1:1,000) have been added. The points of injection are usually six, one on each side of the base, one on the anterior and one on the posterior pillar, and two in the supratonsillar region. The operation should be delayed from seven to ten minutes after the injection.

Speed may be obtained as follows: Each tonsil is seized with a tenaculum forceps devised by the author and the left tonsil is pulled toward the median line and freed from the pillars by means of a dissector. The right tonsil is removed with a snare. While this is being done the assistant places another snare over the left tonsil, and when the forceps and snare which were used on the right tonsil are handed to the assistant, the operator takes the other forceps and snare from him and removes the left tonsil. All bleeding is controlled before the patient leaves the chair or table. OTTO M. ROTT.



**Davies, B. C.: A New Tonsillectomy Technique.**  
*Ann. Otol., Rhinol. & Laryngol.*, 1920, xxix, 396.

In performing a tonsillectomy the author uses a pair of Seiler's turbinal scissors, the backs of the blades of which have been beveled to a semisharp condition so as to produce a more than dull dissection without cutting. After the tonsil is drawn to the median line, the anterior pillar being thus put on the stretch over the tonsils, the scissors are introduced so that the points with the blades closed pass between the pillar and the capsule at their juncture in the upper third. In this position the points are passed outward to the base of the tonsil, no force being necessary, and then opened about  $\frac{1}{2}$  in. From this position, the lower blade being fixed, the upper blade is made to travel over the top of the tonsil, describing an arc which extends down one-third of the posterior pillar. The scissors are then closed and held in position and the lower blade is moved downward while the upper blade is fixed. The operation is completed with the use of the snare.

OTTO M. ROTT.

**Thomson, S.: Intrinsic Cancer of the Larynx, Impaired Mobility of the Affected Cord in Diagnosis and Prognosis: Observations Based on 44 Cases Treated by Laryngofissure.**  
*Lancet*, 1920, cxcix, 183.

Interference with the movement of a vocal cord as a symptom in certain cases of cancer of the larynx was first noted by Lublinski and Semon at about the same date. Semon in his earlier observations suggested that impaired mobility was a usual symptom and occurred at an early period of epithelioma of a vocal cord. This statement led to the belief that a diagnosis of cancer was not justified if there was free movement of the cord and the microscopic examination of the growth was negative. As a consequence the results in these cases were disastrous because an early opportunity for operation was lost. After twenty-one years of further experience, however, Semon corrected his former misconception and formulated the rule: "If the vocal cord from which a suspected laryngeal growth springs shows at an early period of the disease a defect of mobility other than that due to mechanical impaction of the growth in the glottis on phonation, this sign is almost pathognomonic for the malignant character of the tumor. If, however, this sign should yet be absent when the case comes under observation, such negative evidence does by no means exclude possible malignancy."

Mechanical interference with the excursions of the affected cord due to projection of the growth into the glottis is not considered as impairing intrinsic mobility. Of the 44 cases analyzed the affected cord was quite mobile in 27. In the remaining 17 cases its movements were more or less impaired, the degree varying from mere sluggishness to complete fixation. In 3 of the latter cases the defect in movement developed while the patients were under observation. In only 10 cases was it possible to remove a satisfactory portion of the growth for microscopic examination. It is noteworthy that the cord moved freely in no less than 8 of these 10 cases. This shows that impaired mobility is a valuable diagnostic aid as it is more apt to occur in cases in which a satisfactory piece of growth cannot be obtained for microscopic examination. When the growth is embedded or tends to penetrate the cord it is more apt to produce paresis than when it is projecting or semi-pedunculated.

Of the 27 patients with mobile cord, 21 are alive and free from local recurrence, while of the 17 with impaired mobility only 7 are alive and free from local recurrence. It is evident that the prognosis is decidedly less favorable with regard to the ultimate result of a laryngofissure if the cord is paretic or fixed.

In conclusion Thomson states that impaired mobility of a cord is not a necessary or frequent symptom of intrinsic cancer of the larynx and in fact is found in only a minority of the cases. Impaired mobility is more apt to be met with in an early stage of cancer when the growth is embedded or growing into the cord than when it is a sessile or even a pedunculated tumor. It is also more usual when the growth is situated on the inner surface or subglottic area than on the upper surface of the cord. Otherwise fixation indicates an advanced case. When present, it is a very valuable symptom differentiating a malignant from a benign tumor. It is of little value and may even be misleading in differentiating a malignant growth from a tuberculous or syphilitic deposit. "While in some cases it may be necessary to postpone a diagnosis in the absence of this symptom, yet, as it is desirable to avoid any delay, we may have to rely on inspection, the age, sex, history, and progress of the case, and exclusion of other possibilities. The help of microscopic examination of a removed portion is available only in a small number of cases (10 of 44). As regards prognosis it is an unfavorable symptom."

FRENCH K. HANSEL.

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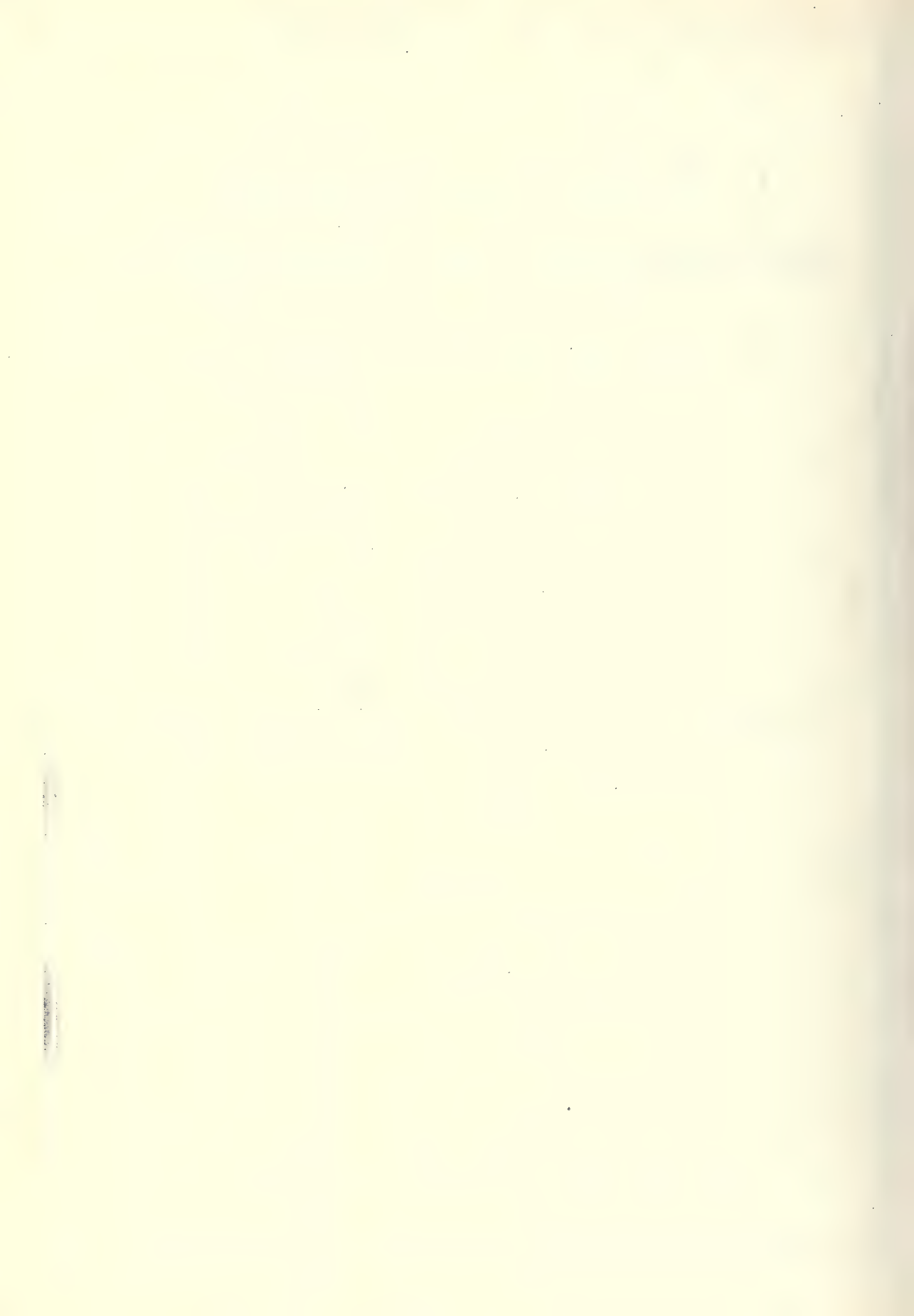
## CONTENTS

I. Index of Abstracts of Current Literature .....	iii
II. Authors .....	viii
III. Abstracts of Current Literature .....	433-492
IV. Bibliography of Current Literature .....	493-504
V. Volume Index .....	i-xxiv

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# ABSTRACTS OF CURRENT LITERATURE

## GENERAL SURGERY

### Operative Surgery and Technique

- BALFOUR, D. C.: The Utility of the Rubber Tube in Intestinal Surgery..... 433
- TADDEI, D.: The Technique of Drainage in Suppurations..... 434
- TAYLOR, R. T.: An Effort to Standardize Surgical Mensuration..... 434
- VOGELER, K.: Intracardial Injection..... 434
- HALSTED, W. S.: A Striking Elevation of the Temperature of the Hand and Forearm Following the Excision of a Subclavian Aneurism and Ligations of the Left Subclavian and Axillary Arteries 435
- OCHSNER, A. J., and SCHEIDER, C. C.: Fatal Post-operative Pulmonary Thrombosis..... 435
- CULBERTSON, C.: The Management of General Pelvic Peritonitis..... 475
- ZARATE, E.: Subcutaneous Symphysiotomy in Argentina..... 479
- TOUPET, R.: The Technique of Nephrostomy..... 484
- KIDD, F.: The Treatment of Calculi Impacted in the Pelvic Portion of the Ureter..... 484
- PETERSON, R.: Uretero-Ureteral Anastomosis..... 485
- STUTZIN, J. J.: The Treatment of the Most Severe Strictures and Fistulæ of the Male Urethra..... 485
- LESPINASSE, V. D.: Local Treatments for Seminal Vesiculitis, with a Description of Some New Methods..... 486
- HAY, P. J.: Some Plastic Operations about the Lids and Socket..... 488
- MORAX, V.: Cataract Operations on Glaucomatous Patients..... 489
- GOULDEN, C.: The Treatment of Prolapse of the Iris Following Accidental Perforating Wounds, with a Note on the Removal of Non-Magnetic Foreign Bodies from the Anterior Chamber..... 489
- MCKINNEY, R.: Tonsillectomy in the Adult under Local Anæsthesia by the Sluder Method..... 491
- FRIEDBERG, S. A.: Direct Laryngoscopy..... 492

### Anæsthesia

- BERRY, M. D., and others: Discussion on Anæsthesia in Operations on the Thyroid Gland..... 436
- RODRIGUEZ and EGANA: General Anæsthesia..... 437
- HEPBURN, W. G.: Stovaine Spinal Anæsthesia..... 438
- BARNES, A. R.: Twilight Sleep; A Report of 30 Cases and a Summary of 5,575 Cases Reported in the Literature..... 478

### Surgical Instruments and Apparatus

- GOODLOE, A. E.: The Dangers, Failures, and Difficulties in Foreign Body Bronchoscopy: A New Instrument for Their Elimination..... 439

### SURGERY OF THE HEAD AND NECK

#### Head

- PUJOL, J. T.: Perforating Tumors of the Cranium... 440
- KROH, F.: Studies Regarding the Relation between the Spinal Fluid and the Medulla Oblongata after Recent Gunshot Injuries of the Skull..... 440
- DEMME, F.: The Indications for the Removal of Foreign Bodies from the Brain..... 441
- OCHSNER, A. J., Endothelioma of the Brain..... 441
- KANAVAL, A. B.: Tumors of the Face..... 442
- CUSHING, H.: The Rôle of Deep Alcohol Injections in the Treatment of Trigeminal Neuralgia..... 442
- CUSHING, H.: The Major Trigeminal Neuralgias and Their Surgical Treatment Based on Experiences with 332 Gasserian Operations. I. The Varieties of Facial Neuralgia..... 442
- CARPENTER, E. R.: Intracranial Lesions Involving the Auditory-Vestibular Apparatus..... 490
- FERRARINI, G.: The Treatment of Fistulæ of Stenon's Duct and Especially the Operation of Disinnervation of the Parotid Proposed by Leriche..... 443

#### Neck

- THOMPSON, J. E.: The Relationship between Ranula and Branchiogenic Cysts..... 443
- DEGASTANO, L.: Congenital Cysts of the Neck..... 444
- WEISE, H.: Gunshot Injuries of the Common and Internal Carotid Arteries and Their First Treatment 444
- KLOSE, H.: The Acute Inflammations of the Thyroid; Their Etiology, Course, and Surgical Treatment. 444
- MAYO, C. H.: Adenoma with Hyperthyroidism..... 445
- FRAZIER, C. H.: The Management of Toxic Goiter from the Surgical Point of View..... 445
- JUDD, E. S.: The Results of Operations for Adenoma with Hyperthyroidism and Exophthalmic Goiter 446
- CRILE, G. W.: Toxic Adenoma in Relation to Exophthalmic Goiter..... 446
- AIKENS, W. H. B.: Radium in Toxic Goiter..... 446

### SURGERY OF THE CHEST

#### Chest Wall and Breast

- LEE, B. J., and ADAIR, F.: Traumatic Fat Necrosis of the Female Breast..... 447
- JACKSON, J. N.: The Technique in Operations for Cancer of the Breast..... 447
- MEYER, W.: The Late Results after Radical Operation for Cancer of the Breast..... 447

#### Trachea and Lungs

- JEAN, G.: Glandular Abscess (Adenophlegmon) of the Pulmonary Hilum..... 448

**Pharynx and Œsophagus**

- THOMAS, C. C.: The Roentgen Examination of the Œsophagus..... 448

**Miscellaneous**

- FOOT, N. C.: Report of a Case of Malignant Thymoma with Necropsy..... 449

**SURGERY OF THE ABDOMEN****Abdominal Wall and Peritoneum**

- EARL, G.: A Modified Inguinal Hernia Technique... 449  
DENZER, B.: A New Method of Diagnosis of Peritonitis in Infancy and Childhood..... 449  
CHASSOT: Peritoneal Menstruation..... 474

**Gastro-Intestinal Tract**

- BIRCHER, E.: Resection of Branches of the Vagus Nerve in the Treatment of Gastric Affections... 450  
ROSENTHAL, E.: The Symptoms and Therapy of Gastric and Duodenal Ulcer..... 450  
DUVAL, P.: New Points in the Treatment of Ulcer of the Lesser Curvature..... 450  
BING, H. I.: Polycythæmia in Ulcer Near the Pylorus 451  
HEY, R.: Pneumatosis Cystoides Intestini Hominis.. 451  
SUMMERS, J. E.: Acute Intestinal Obstruction, the Cause of High Mortality: How This May Be Reduced..... 452  
BREWITT, R.: Obstruction of the Bowel Due to Exudates Following Gynecological Operations and Its Treatment..... 452  
WOOD, W. Q.: Resection of the Colon by the Three-Stage Method..... 453  
AXTELL, W. H.: Appendicitis, Hernia, and Anorectal Diseases of the Young Soldier..... 453  
WHITE, F. W.: A Brief Experience with Appendicectomy and Cæcostomy for Intestinal Stasis in Epilepsy and Neurasthenia..... 454  
CHASE, I. C.: The Surgical Principles Involved in the Treatment of Rectal Fistulæ..... 454  
COCKE, N. P., and MASON, J. M.: The Management of Acute Appendicitis Developing in the Latter Weeks of Pregnancy; Report of a Case Treated by Cæsarean Section and Appendectomy..... 478

**Liver, Gall-Bladder, Pancreas, and Spleen**

- ROUS, P., and LARIMORE, L. D.: The Biliary Factor in Liver Lesions..... 455  
FINSTERER, H.: The Diagnosis and Treatment of Liver Injuries..... 455  
ZERBINO, V.: The Relation between Hydatid Cysts of Children and Those of Adults..... 456  
CARRO, S.: The X-Ray Diagnosis of Gall-Stones... 456  
WARREN, R.: The Treatment of the Diseased Gall-Bladder..... 457  
KRABEL, M.: Torsion of the Neck of the Gall-Bladder..... 457  
HUTCHINSON, H. S., and FLEMING, G. B.: The Digestion and Absorption of Fats in a Case of Congenital Atresia of the Bile-Ducts..... 457  
SPEED, K.: Carcinoma of the Pancreas..... 457

**Miscellaneous**

- KAESTLE, C.: The Healing Effect of Air in the Abdominal Cavity..... 458

**SURGERY OF THE EXTREMITIES****Diseases of the Bones, Joints, Muscles, Tendons, Etc.**

- COLEY, W. B.: Sarcoma of the Clavicle—Results Following Total Excision..... 458  
OWEN, W. B.: The Treatment of Knee-Joint Infections..... 459  
BEUST, A. T.: Osteitis Fibrosa and Bone Cyst with Congenital Fracture of the Tibia..... 459  
FREIBERG, A. H.: Injuries to the Sesamoid Bones of the Great Toe..... 459  
MONAHAN, J. J.: The Etiology of Bunions..... 460

**Fractures and Dislocations**

- CRILE, W. D.: The Treatment of Septic Fracture... 460  
CAMPBELL, W.: Ununited Fractures of the Neck of the Femur..... 461  
JONES, S. F.: Fracture of the Tibial Spine..... 461  
AMMARELL, W. H.: Fractures between the Ankle and the Middle of the Tibia..... 461

**Surgery of the Bones, Joints, Muscles, Tendons, Etc.**

- RATH, H.: Accident Surgery and Secondary Wound Healing..... 462  
LOTSCH, F.: The Healing Processes in the Conservative Treatment of Cystic Osteomyelitis..... 462  
SARRIA, P. A.: A Contribution to the Study of Bone Transplantation..... 462  
ZADEK, I.: The Correction of Congenital Club-Foot in Infants..... 463

**Orthopedics in General**

- MARSHALL, H. W.: The Muscles and Ligaments of the Lumbar and Pelvic Regions; Their Mechanical Arrangement and the Treatment of Their Weaknesses..... 464

**SURGERY OF THE SPINAL COLUMN AND CORD**

- JOHNSON, N. A.: A Surgical Operation for Lumbago and Sciatic Rheumatism..... 464  
WILLIAMSON, R. T.: The Diagnosis of Spinal Meningeal Tumor and Its Practical Importance..... 464

**MISCELLANEOUS****Clinical Entities—General Physiological Conditions**

- LOVE, P. J. M.: Some Surgical Complications of Dysentery..... 465  
LAWRENCE, C. H.: Observations upon Ductless Gland Therapy..... 466  
MUELLER, M.: Genital Tuberculosis of the Female from the Modern Viewpoint Regarding Tuberculosis, and the Question of Ovarian Tuberculosis and Primary Abdominal Pregnancy..... 474



- GELLHORN, G.: The Reactions of Syphilis in Women 475
- ELLIOTT, I. H.: Pregnancy and Tuberculosis. . . . . 477
- WILLIAMS, J. W.: The Significance of Syphilis in Prenatal Care and in the Causation of Foetal Death. . . . . 481
- NAUSSAUER, M.: Malignant Bladder Tumors in Employees of the Organic Chemical Industry.. 485
- MATSUOKA, Y.: The Nature of the So-Called Blood Infiltration of the Cornea. . . . . 488
- SALZMANN, S. R.: Tonsil Infections. . . . . 491
- CANFIELD, R. B.: The Role of the Tonsils in Pulmonary Tuberculosis. . . . . 491
- Sera, Vaccines, and Ferments**
- BONNEY, V.: An Introductory Paper on the Prevention and Treatment of Puerperal Sepsis . . . . . 480
- Blood**
- BUSMAN, G. J.: Rubber Tubing as a Factor in the Reaction to Blood Transfusion . . . . . 467
- BLOCH, M.: Coagulation of the Blood: A Study of the Anticoagulant Action of Sodium Citrate and of the Part Played by Calcium in the Blood. . . . . 467
- Blood and Lymph Vessels**
- HAELLER, J.: The Surgical Treatment of Popliteal Aneurism. . . . . 468
- Surgical Diagnosis, Pathology, and Therapeutics**
- GLASS, E.: The Treatment of Surgical Tuberculosis with Injections of Turpentine. . . . . 468
- CROSBIE, A. H.: The Diagnosis and Treatment of Tuberculosis of the Genito-Urinary Tract. . . . . 486
- BENEDICT, W. L.: The Early Diagnosis of Pituitary Tumor with Ocular Phenomena. . . . . 488
- VAIL, H. H.: Studies of the Barany Rotation and Caloric Tests of Tumors of the Nervus Acusticus 489
- Experimental Surgery and Surgical Anatomy**
- SWARTZ, E. O.: A New Culture Method for the Gonococcus: Report of Experimental Studies... 468
- SILVESTRI, L.: Experimental Research Regarding the Changes in the Hepatic Tissue Following Splenectomy. . . . . 469
- SABUCEDO, C.: A Contribution to the Histopathologic Study of the Suprarenal Glands in Tetanus Intoxication. . . . . 469
- MACHT, D. I., and MATSUMOTO, S.: Physiological and Pharmacological Studies of the Prostate Gland. II. The Action of Prostatic Extracts on Excised Genito-Urinary Organs. . . . . 486
- TARDO, G. V.: The Formation of Calculi about Foreign Bodies. . . . . 487
- Roentgenology and Radium Therapy**
- DAVIS, J. S.: The Radical Treatment of X-Ray Burns. . . . . 469
- BOGGS, R. H.: Lethal and Erythema Dosage of Radium in Malignancy. . . . . 470
- SCHMITZ, H.: Observations on the Technique and Indications of Radiumtherapy in Uterine Carcinoma. 472
- STEPHEN, A.: The X-Ray Treatment of Peritoneal and Genital Tuberculosis in the Female. . . . . 474
- DIETRICH, H. A.: The Results Obtained with Mesothorium and Radium in the Treatment of Carcinoma of the Genital Organs at the Goettingen University Gynecological Clinic. . . . . 476
- RAMDOHR, P.: The Treatment of Laryngeal Tuberculosis with the X-Ray. . . . . 492
- Legal Medicine**
- The Rights of Physicians, Associations, and Sanatoriums. . . . . 471
- Objection to Physician's Testimony as Privileged Must Be Timely. . . . . 471
- Privileged Communications and Waiver—Unethical Practice. . . . . 471

## GYNECOLOGY

- Uterus**
- HEINEBERG, A.: Uterine Curettage. . . . . 472
- CASLER, D. B.: A Unique, Diffuse Tumor, Really an Adenomyoma with Stroma But No Glands; Menstruation after Complete Hysterectomy Due to Uterine Mucosa in Remaining Ovary. . . . . 472
- SCHMITZ, H.: The Technique and Indications of Radium Therapy in Uterine Carcinoma . . . . . 472
- POLAK, J. O.: Total Hysterectomy in Fibroid Tumors of the Uterus . . . . . 473
- Adnexal and Peri-Uterine Conditions**
- SCHOCHET, S. S.: The Physiology of Ovulation. . . 473
- BREWITT, R.: Obstruction of the Bowel Due to Exudates Following Gynecological Operations.. 452
- Miscellaneous**
- CHASSOT: Peritoneal Menstruation. . . . . 474
- MUELLER, M.: Genital Tuberculosis of the Female from the Modern Viewpoint Regarding Tuberculosis, and the Question of Ovarian Tuberculosis and Primary Abdominal Pregnancy. . . . . 474
- STEPHEN, S.: The X-Ray Treatment of Peritoneal and Genital Tuberculosis in the Female. . . . . 474
- GELLHORN, G.: The Reactions of Syphilis in Women. 475
- CULBERTSON, C.: The Management of General Pelvic Peritonitis. . . . . 475
- DIETRICH, H. A.: The Results Obtained with Mesothorium and Radium in the Treatment of Carcinoma of the Genital Organs at the Goettingen Gynecological Clinic. . . . . 476

## OBSTETRICS

**Pregnancy and Its Complications**

- ELLIOTT, I. H.: Pregnancy and Tuberculosis..... 477  
 WALLIS, R. L. M.: The Diastase Content of the Urine in the Toxæmias of Pregnancy..... 477  
 COCKE, N. P., and MASON, J. M.: The Management of Acute Appendicitis Developing in the Latter Weeks of Pregnancy; Report of a Case Treated by Cæsarean Section and Appendectomy..... 478

**Labor and Its Complications**

- BARNES, A. R.: Twilight Sleep; A Report of 30 Cases and a Summary of 5,575 Cases Reported in the Literature..... 478

- ZARATE, E.: Subcutaneous Symphysiotomy in Argentina..... 479

**Puerperium and Its Complications**

- BONNEY, V.: An Introductory Paper on the Prevention and Treatment of Puerperal Sepsis..... 480

**Miscellaneous**

- WILLIAMS, J. W.: Syphilis in Prenatal Care and in the Causation of Fœtal Death..... 481  
 GONZÁLEZ, J. B.: The Modular Angle of the Normal Pelvis or the Problem of the Geometrical Pelvis..... 482

## GENITO-URINARY SURGERY

**Adrenal, Kidney, and Ureter**

- LETT, H.: Renal Calculus..... 483  
 BRAASCH, W. F.: Conditions Contra-Indicating Operation with Stone in the Kidney and Ureter. 483  
 RYTINA, A. G.: Treatment of Essential Renal Hæmaturia by Intrapelvic Injections of Silver Nitrate. 484  
 TOUPET, R.: The Technique of Nephrostomy..... 484  
 KIDD, F.: The Treatment of Calculi Impacted in the Pelvic Portion of the Ureter..... 484  
 PETERSON, R.: Uretero-Ureteral Anastomosis..... 485

**Bladder, Urethra, and Penis**

- NAUSSAUER, M.: Malignant Bladder Tumors in Employees of the Organic Chemical Industry... 485  
 STUTZIN, J. J.: The Treatment of the Most Severe Strictures and Fistulæ of the Male Urethra..... 485

**Genital Organs**

- MACHT, D. I., and MATSUMOTA, S.: Physiological and Pharmacological Studies of the Prostate Gland. II. The Action of Prostate Extract on Excised Genito-Urinary Organs..... 486  
 LESPINASSE, V. D.: Local Treatments for Seminal Vesiculitis, with a Description of Some New Methods..... 486

**Miscellaneous**

- LABBÉ, M., and CARRIÉ, P. A.: The Enterohepatic Theory of Urobilinuria..... 486  
 CROSBIE, A. H.: The Diagnosis and Treatment of Tuberculosis of the Genito-Urinary Tract..... 486  
 TARDO, G. V.: The Formation of Calculi about Foreign Bodies..... 487

## SURGERY OF THE EYE AND EAR

**Eye**

- BENEDICT, W. L.: The Early Diagnosis of Pituitary Tumor with Ocular Phenomena..... 488  
 HAY, P. J.: Some Plastic Operations about the Lids and Socket..... 488  
 MATSUOKA, Y.: The Nature of the So-Called Blood Infiltration of the Cornea..... 488  
 MORAX, V.: Cataract Operations on Glaucomatous Patients..... 489

- GOULDEN, C.: The Treatment of Prolapse of the Iris Following Accidental Perforating Wounds, with a Note on the Removal of Non-Magnetic Foreign Bodies from the Anterior Chamber..... 489

**Ear**

- VAIL, H. H.: Studies of the Barany Rotation and Caloric Tests of Tumors of the Nervus Acusticus. 489  
 CARPENTER, E. R.: Intracranial Lesions Involving the Auditory-Vestibular Apparatus..... 490

## SURGERY OF THE NOSE, THROAT, AND MOUTH

**Nose**

- ARMSTRONG, M.: The Clinical Significance of the Bacteriological Examination of the Accessory Nasal Sinuses and the Ears..... 491

**Throat**

- SALZMAN, S. R.: Tonsil Infections..... 491  
 CANFIELD, R. B.: The Rôle of the Tonsils in Pulmonary Tuberculosis..... 491



McKINNEY, R.: Tonsillectomy in the Adult under Local Anæsthesia by the Sluder Method.....	491
RAMDOHR, P.: The Treatment of Laryngeal Tuberculosis with the X-Ray.....	492
FRIEDBERG, S. A.: Direct Laryngoscopy .....	492

**Mouth**

FERRARINI, G.: The Treatment of Fistulæ of Stenon's Duct and Especially the Operation of Disinervation of the Parotid Gland Proposed by Leriche .....	443
---	-----

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## BIBLIOGRAPHY

**GENERAL SURGERY****SURGICAL TECHNIQUE**

Operative Surgery and Technique.....	493
Aseptic and Antiseptic Surgery.....	493
Anæsthesia.....	493
Surgical Instruments and Apparatus.....	493

**SURGERY OF THE HEAD AND NECK**

Head.....	493
Neck.....	494

**SURGERY OF THE CHEST**

Chest Wall and Breast.....	494
Trachea and Lungs.....	495
Heart and Vascular System.....	495
Pharynx and Oesophagus.....	495
Miscellaneous.....	495

**SURGERY OF THE ABDOMEN**

Abdominal Wall and Peritoneum.....	495
Gastro-Intestinal Tract.....	495
Liver, Gall-Bladder, Pancreas, and Spleen.....	496
Miscellaneous.....	496

**SURGERY OF THE EXTREMITIES**

Diseases of the Bones, Joints, Muscles, Tendons, Etc.....	497
Fractures and Dislocations.....	497
Surgery of the Bones, Joints, Muscles, Tendons, Etc.....	497
Orthopedics in General.....	498

**SURGERY OF THE SPINAL COLUMN AND CORD.....****SURGERY OF THE NERVOUS SYSTEM.....****MISCELLANEOUS**

Clinical Entities—General Physiological Conditions.....	498
Sera, Vaccines, and Ferments.....	499
Blood.....	499
Blood and Lymph Vessels.....	499
General Bacterial Infections.....	499
Surgical Diagnosis, Pathology, and Therapeutics.....	499
Experimental Surgery and Surgical Anatomy.....	499
Roentgenology and Radium Therapy.....	499
Military Surgery.....	500
Industrial Surgery.....	500
Hospitals; Medical Education and History.....	500
Legal Medicine.....	500

**GYNECOLOGY**

Uterus.....	500
Adnexal and Peri-Uterine Conditions.....	501
External Genitalia.....	501
Miscellaneous.....	501

**OBSTETRICS**

Pregnancy and Its Complications.....	501
Labor and Its Complications.....	501
Puerperium and Its Complications.....	502
New-Born.....	502
Miscellaneous.....	502

**GENITO-URINARY SURGERY**

Adrenal, Kidney, and Ureter.....	502
Bladder, Urethra, and Penis.....	502
Genital Organs.....	5
Miscellaneous.....	429

**SURGERY OF THE EYE AND EAR**

Eye.....	430
Ear.....	430

**SURGERY OF THE NOSE, THROAT, AND MOUTH**

Nose.....	431
Throat.....	431
Mouth.....	432

## AUTHORS

## OF THE ORIGINAL CONTRIBUTIONS WHICH ARE ABSTRACTED IN THIS NUMBER

- Adair, F., 447  
 Aikins, W. H. B., 446  
 Ammarell, W. H., 461  
 Armstrong, M., 491  
 Axtell, W. H., 453  
 Balfour, D. C., 433  
 Barnes, A. R., 478  
 Benedict, W. L., 488  
 Berry, M. D., 436  
 Beust, A. T., 459  
 Bing, H. I., 451  
 Bircher, E., 450  
 Bloch, M., 467  
 Boggs, R. H., 470  
 Bonney, V., 480  
 Braasch, W. F., 483  
 Brewitt, R., 452  
 Busman, G. J., 467  
 Campbell, W., 461  
 Canfield, R. B., 491  
 Carpenter, E. R., 490  
 Carrié, P. A., 486  
 Carro, S., 456  
 Casler, D. B., 472  
 Chase, I. C., 454  
 Chassot, 474  
 Cocke, N. P., 478  
 Coley, W. B., 458  
 Crile, G. W., 446, 460  
 Crosbie, A. H., 486  
 Culbertson, C., 475  
 Cushing, H., 442  
 Davis, J. S., 469  
 DeGastano, L., 444  
 Demmer, F., 441  
 Denzer, B., 449  
 Dietrich, H. A., 476  
 Duval, P., 450  
 Earl, G., 449  
 Egana, 437  
 Elliott, I. H., 477  
 Ferrarini, G., 443  
 Finsterer, H., 455  
 Fleming, G. B., 457  
 Foot, N. C., 449  
 Frazier, C. H., 445  
 Freiberg, A. H., 459  
 Friedberg, S. A., 492  
 Gellhorn, G., 475  
 Glass, E., 468  
 González, J. B., 482  
 Goodloe, A. E., 439  
 Goulden, C., 489  
 Haeller, J., 468  
 Halsted, W. S., 435  
 Hay, P. J., 488  
 Heineberg, A., 472  
 Hepburn, W. G., 438  
 Hey, R., 451  
 Hutchinson, H. S., 457  
 Jackson, J. N., 447  
 Jean, G., 448  
 Johanson, N. A., 464  
 Jones, S. F., 461  
 Judd, E. S., 446  
 Kaestle, C., 458  
 Kanaval, A. B., 442  
 Kidd, F., 484  
 Klose, H., 444  
 Krabbel, M., 457  
 Kroh, F., 440  
 Labbé, M., 486  
 Larimore, L. D., 455  
 Lawrence, C. H., 466  
 Lee, B. J., 447  
 Lespinasse, V. D., 486  
 Lett, N., 483  
 Lotsch, F., 462  
 Love, P. J. M., 465  
 Macht, D. I., 486  
 Marshall, H. W., 464  
 Mason, J. M., 478  
 Matsumoto, S., 486  
 Matsuoka, Y., 488  
 Mayo, C. H., 445  
 McKinney, R., 491  
 Meyer, W., 447  
 Monahan, J. J., 460  
 Morax, V., 489  
 Mueller, M., 474  
 Naussauer, M., 485  
 Ochsner, A. J., 435, 441  
 Owen, W. B., 459  
 Peterson, R., 485  
 Polak, J. O., 473  
 Pujol, J. T., 440  
 Ramdohr, P., 492  
 Rath, H., 462  
 Rodriguez, 437  
 Rosenthal, E., 450  
 Rous, P., 455  
 Rytina, A. G., 484  
 Sabucedo, C., 469  
 Salzman, S. R., 491  
 Sarria, P. A., 462  
 Schmitz, H., 472  
 Schneider, C. C., 435  
 Schochet, S. S., 473  
 Silvestrini, L., 469  
 Speed, K., 457  
 Stephan, S., 474  
 Stutzin, J. J., 485  
 Summers, J. E., 452  
 Swartz, E. O., 468  
 Taddei, D., 434  
 Tardo, G. V., 487  
 Taylor, R. T., 434  
 Thomas, C. C., 448  
 Thompson, J. E., 443  
 Toupet, R., 484  
 Vail, H. H., 489  
 Vogeler, K., 434  
 Wallis, R. L. M., 477  
 Warren, R., 457  
 Weise, H., 444  
 White, F. W., 454  
 Williams, J. W., 481  
 Williamson, R. T., 464  
 Wood, W. Q., 453  
 Zadek, I., 463  
 Zarate, E., 479  
 Zerbino, V., 456



# INTERNATIONAL ABSTRACT OF SURGERY

DECEMBER, 1920

## ABSTRACTS OF CURRENT LITERATURE GENERAL SURGERY—SURGICAL TECHNIQUE

### OPERATIVE SURGERY AND TECHNIQUE

**Balfour, D. C.:** *The Utility of the Rubber Tube in Intestinal Surgery.* *Surg., Gynec. & Obst.*, 1920, xxxi, 184.

Technical difficulty and high risk are always factors in intestinal operations for malignancy, such as resections of the sigmoid, rectosigmoid juncture, or upper rectum. Among mechanical devices which modify these factors favorably the rubber tube has proved of distinct value as employed in connection with such operations at the Mayo Clinic.

In 1910 Balfour described the technique of "tube resections" of the sigmoid as then carried out at the Mayo Clinic where they have been employed for some time. The value of the tube had been recognized for a number of years by certain English surgeons. Modifications of the technique as described in this article have brought about better results and a definite increase in operability. Balfour draws attention to these facts by presenting abstracts of case reports representing some of the conditions in which the rubber tube has been employed and illustrating its utility in intestinal surgery.

The tube used is  $\frac{3}{4}$  in. in diameter and  $\frac{1}{2}$  in. in caliber and has a lateral eye 1 in. from the upper end. After the resection is made the tube is passed through the open end of the lower segment into the rectum and anus where it is secured by an assistant who draws it downward until its upper end is brought below the cut end of the lower segment. The cut ends of the bowel are then approximated and fixed by two stay sutures, one at the mid-point of each lateral wall of the bowel. A heavy (No. 2) chromic catgut suture is introduced from the mucus side at one stay suture and continued posteriorly, including the muscle and mucus layers until the second stay suture is reached. It is then continued forward in the usual manner until the circular anastomosis is completed.

The tube is then passed up the bowel until its upper end is from 3 to 12 in. above the level of the anastomosis. Its correct height must be gauged by the ease with which it takes its position in the upper segment. It is then secured in its best position by a heavy catgut suture placed close to the level of anastomosis in order that it will be invaginated with the anastomosis in the next step of the operation. The invagination is made by supporting the bowel with fine-toothed forceps which grasp it at points about 1 in. below the level of the anastomosis while an assistant draws the anastomosis downward about 1 in. into the lower segment by means of traction on the tube. The invagination, which is an important part of the operation, appears, when completed, like a small intussusception. The two segments are fixed in this position by three or four interrupted sutures. Excellent results follow even when it is impossible to produce such an invagination or to unite the ends of the bowel perfectly over the tube, and also in cases in which a visible defect in the line of anastomosis is present (usually on the posterior side). Fæcal fistulæ which may follow are insignificant and heal spontaneously. As a rule the abdomen may be closed without drainage.

The abstracts of cases illustrating the utility of the tube cover such operations as resections for cancer of the sigmoid, diverticulitis of the sigmoid, the repair of fæcal fistulæ, operations for chronic and subacute obstruction, resection of the transverse colon, and the closure of a colostomy.

The use of the tube accords with sound principles of gastro-intestinal surgery. Its mechanical functions are called on chiefly in axial anastomosis, the closure of colostomies, and the repair of fæcal fistulæ. It prevents distention and gross leakage when an insecure anastomosis results from wide resection or fixed bowel segments, or both. In the invariable re-formation of adhesions it prevents the kinking or malposition that may result in obstruction by acting

as a splint. The successful closure of a colostomy sometimes requires suturing sufficient to constrict the lumen beyond the limit of safety. The tube prevents further contraction and conveys gases and faecal matter beyond the line of closure. It may prove of value also in disturbances of the gastrointestinal tract resulting from malfunction of the neuromuscular mechanism (tonic spasm, atony due to sympathetic irritation, and irregular contractions due to parasympathetic irritation). An important factor in congenital dilatation of the colon (Hirschsprung's disease) seems to be chronic spasm of the rectosigmoid sphincter; a method for repeated stretching of this sphincter, similar in principle to that used successfully in cardiospasm, may render a formidable operation unnecessary.

Sampson Handley suggested that certain cases of postoperative intestinal paresis with general peritonitis are due to spasm of the sphincter of the rectosigmoid juncture as well as of the long sphincter in the terminal and pelvic ileum. Handley relieves distention and obstruction in both by an ileocolic anastomosis (ileum to ascending colon) combined with a cecostomy. Balfour has found that in some of these cases a colostomy may be avoided by introducing a tube through the rectum beyond the point of spasm of the rectosigmoid. He suggests that in certain cases of paresis the anastomosis of the ileum and colon, rather than an enterostomy, should be given more consideration than in the past.

The rubber tube has proved a most important factor of safety and has brought about satisfactory results in the serious and difficult operations in which it has been employed at the Mayo Clinic.

J. F. McDONALD.

**Taddei, D.: The Technique of Drainage in Suppurations** (La tecnica del drenaggio nelle suppurazioni). *Riforma med.*, 1920, xxxvi, 447.

Taddei states that aseptic drainage after ample incision of the tissues is still the best means of overcoming local suppuration but that the majority of practitioners, other than surgeons, do not know how properly to drain an abscess, a phlegmon, or a infected wound. The reason is to be found in the inadequate surgical instruction of medical students, the lack of sufficient information on this important subject in the ordinary medical and surgical textbooks, and general ignorance regarding modern surgical physiopathology. The information in textbooks does not give the minute technical details of the drainage of phlegmons, etc., or the fundamental facts upon which such drainage should be based.

In this article Taddei briefly describes the details of the technique of drainage in the treatment of common local suppurative infections. Tubular drainage, he believes, should be used only when a suppurating cavity is to be drained, when it is impossible to make a large opening, or when the drain cannot be safely inserted at the lowest point. The use of a tube drain, unless there is some anatomical reason for it, is an error.

The introduction of gauze into a suppurating cavity insufficiently opened is a blind and dangerous procedure. The best method of determining how and where gauze should be inserted is to introduce a gloved finger.

Taddei emphasizes the necessity for the radical treatment of any local suppurative process which persists in spite of conservative treatment as such a suppuration is a grave menace to the body.

WILLIAM A. BRENNAN.

**Taylor, R. T.: An Effort to Standardize Surgical Mensuration.** *N. York M. J.*, 1920, cxii, 109.

It is advisable that any device adopted for recording motion should be applicable to all joints. In addition it should be simple in construction, inexpensive, and easy to use, so that the variations between the readings made by different persons will be slight.

Four comparative records are required in involved and uninvolved extremities and joints on the two sides, viz.: (1) the length of the extremities; (2) the circumference of the extremities; (3) the motion of each joint; and (4) the position of the angle of malposition in ankylosis or partial ankylosis on the spine. In addition, the extent of deviations in an anteroposterior or lateral direction, the limitation of motion in the different regions, and the amount of rotation in scoliosis should be recorded.

A description and an illustration of an examining table are given and in several illustrations it is shown how the simple graduated semicircle and protractors for measuring joint motions are used.

The apparatus required consists of: (1) a table; (2) a graduated semicircle and protractor; (3) a cotton spring tape measure; (4) a lead tape measure; (5) a rectangular drawing triangle; and (6) a yard stick.

The following landmarks are suggested: (1) the suprasternal notch; (2) the tip of the xiphoid cartilage; (3) the symphysis pubis; (4) the anterior superior spines; (5) the anterior tibial tubercles; (6) the malleoli; (7) the acromion processes; (8) the olecranon processes; (9) the styloid processes of the ulnæ; (10) the vertebra prominens; (11) the posterior superior spines; (12) the ischial tuberosities; (13) the greater trochanters; and (14) the gluteal notch.

CARL R. STEINKE.

**Vogeler, K.: Intracardial Injection** (Die intrakardiale Injektion). *Deutsche med. Wchnschr.*, 1920, xlvii, 745.

The author reports the case of a 14-year-old patient who, during a laparotomy for obstructive ileus due to postoperative adhesions, went into complete collapse. By means of the intracardial injection of 1 ccm. of adrenalin Vogeler was able twice, although each time only for a short period, to restart the heart action and respiration and cause a return of consciousness.

Intracardial injections of adrenalin have been given frequently, but usually the results have been



only temporary. Zuntz, however, has reported a case of operative shock in which the beneficial action persisted and the patient lived.

For a single injection  $\frac{1}{2}$  mg. should be given. The maximum dose is 1 mg. Because of the rapid action of the adrenalin there is no danger of a cumulative effect and the injection may be repeated within a few minutes if necessary.

The best site for the injection is in the third interspace on the left side at the sternal border where the right ventricle may be reached. In his own case the author injected about 2 ccm. to the left of the left sternal border, but states that if the injection is made close to the sternum the internal mammary vessels will be more surely avoided. Vogeler believes he injected the ventricular wall and did not enter the ventricular cavity. The action of the pituitrin is to be regarded as a "lashing" of the heart. Additional stimulation may be given hypodermically.

In the author's opinion intracardial injection is the quickest and most powerful method of stimulating the heart, and is indicated in cases of operative shock.

H. V. WAGNER (Z).

**Halsted, W. S.: A Striking Elevation of the Temperature of the Hand and Forearm Following the Excision of a Subclavian Aneurism and Ligations of the Left Subclavian and Axillary Arteries.** *Bull. Johns Hopkins Hosp.*, 1920, xxxi, 219.

In a series of very interesting papers Leriche has called attention to the value of what he terms "peri-arterial sympathectomy" in the treatment of various neuralgias, local ischæmias, reflex contractions of the Babinski-Fröment type, and other affections. The author's interest in Leriche's work was reawakened by an observation made in the surgical clinic of the Johns Hopkins University only a few weeks before this paper was written.

In 1918 he ligated the left subclavian and carotid arteries near their origin from the aorta for the cure of a huge subclavian aneurism. For a year the aneurism decreased steadily in size. Then for a year he lost track of the patient. About two months ago he succeeded in tracing him and persuaded him to let him excise the aneurism which in the period of non-observation had developed a faint pulsation and had become slightly larger. About four hours after this operation, at which the aneurism was excised and the subclavian and axillary arteries were ligated, it was noticed that the left hand and forearm, which for two years had been strikingly cold, had become abnormally warm—appreciably warmer than the corresponding limb. Unfortunately the surface thermometer belonging to the clinic had been broken and it had been impossible to obtain another.

About five weeks after the operation the hand and forearm became cold again, at first in small areas, but remained cold for only a day or two. On the sixty-ninth day after the operation the back of the left hand was quite cold, whereas the left palm was

about as warm as the right. The temperature of the hand and forearm varied from day to day and from hour to hour. Certain small and quite well-defined areas remained uniformly cool, while the hand and the forearm maintained their normal warmth.

The patient was observed frequently throughout the year following the operation. Slowly but steadily the pulseless tumor diminished in size during this period. Then for a year the patient was lost sight of. Exactly two years after the first operation he returned to the hospital at the author's solicitation. Then for the first time since the operation a very faint pulsation was discernible. The tumor measured in its transverse (frontal) diameter precisely the same as when last seen a year before; the anteroposterior (sagittal) measurement, however, showed an increase of about 4 cm. Halsted decided that the aneurism should be excised, and on the twentieth of April, 1920, performed another operation. About four hours after this second operation the hand and forearm, which prior to, and ever since, the first operation had been markedly cold, became strikingly warm. It had remained warm, except in certain areas, to the time this paper was written.

Halsted believes it improbable that the ligation of the cephalic vein was in any way responsible for this indubitable improvement in the circulation. He attributes it to vasodilatation incident to the ligations of the subclavian and axillary arteries—to the crushing of their nerves.

GEORGE E. BEILBY.

**Ochsner, A. J., and Schneider, C. C.: Fatal Post-operative Pulmonary Thrombosis.** *Ann. Surg.*, 1920, lxxii, 91.

The authors review 37 of the most important monographs on pulmonary thrombosis which have appeared in the literature during the past seventy years, and analyze the causes with a view to determining prophylactic methods.

All authorities agree that no single cause is responsible for the condition, each laying more or less stress upon several of the following twelve factors, which are arranged in the order of their importance: (1) local infection; (2) anæmia; (3) slowing of the blood stream; (4) subnormal general physical condition; (5) cachexia; (6) micro-organisms in the blood; (7) excess of white blood cells; (8) imperfect hæmostasis; (9) traumatization of tissues with retractors, etc.; (10) injury to the veins of the extremities due to a badly arranged operating table; (11) injury to the intima of the veins; (12) excess of calcium salts in the blood.

All deaths from pulmonary thrombosis occurring in the surgical department of the Augustana Hospital, Chicago, during the five years from Jan. 1, 1915, to Jan. 1, 1920, have been tabulated, and an analysis has been made of the history of each case to determine how the thrombosis might have been prevented.

## CASES OF PULMONARY THROMBOSIS

Case	Sex	Age	Diagnosis	Operation	Days following operation	Predisposing Cause of Embolism
1	M	42	Osteochondroma of left ileum	Excision of osteochondroma	4	Phlebitis
2	M	46	Gastric ulcer; cholecystitis; chronic appendicitis	Posterior gastro-enterostomy; cholecystectomy; appendectomy.	6	Perforated ulcer with pre-operative loss of weight
3	F	33	Cholecystitis; retroversion; rectocele.	Cholecystectomy; perineorrhaphy	2	
4	F	44	Carcinoma of rectum	Colostomy	3	
5	M	65	Hypertrophied prostate	Suprapubic prostatectomy	15	Cachexia; phlebitis of left leg
6	F	33	Gestation; third degree laceration of perineum	Parturition; perineorrhaphy	14	Perineal sepsis
7	F	51 rec.	Cholelithiasis; carcinoma of rectum	Cholecystectomy; panhysterectomy	7	Anæmia; cachexia
8	F	43	Floating kidney; cholecystitis; appendicitis.	Nephropexy; cholecystectomy; appendectomy	12	Pre-operative loss of weight 35 lb.

During this period 7 deaths occurred from pulmonary thrombosis in a series of 16,966 operations, or 1 death in 2,385 cases (0.042 per cent). There were 5,275 abdominal sections in the series, with 5 deaths or 1 death in 1,055 cases (less than 0.1 per cent). Among 528 hysterectomies there was 1 death (less than 0.5 per cent). There was also 1 death following childbirth, a case in which an extensive perineal laceration was repaired immediately after delivery. As during the same period there were 1,099 deliveries in the hospital, the mortality from this cause was less than 0.1 per cent.

The accompanying table gives the important data concerning these cases.

In the opinion of the authors it is probable that most of these deaths could have been prevented.

In Case 1, a ligation of the femoral vein above the location of the phlebitis might have prevented the loosening of the embolus.

In Case 2, preliminary transfusion of whole blood and a two-stage operation — gastro-enterostomy in the first stage, cholecystectomy and appendectomy in the second — might have prevented the formation of the thrombus.

In Case 3, it is probable that the veins in the rectoperineal septum were unnecessarily traumatized.

In Case 4, the veins in the mesentery of the sigmoid probably were traumatized unnecessarily.

In Case 5, it is doubtful whether any precautions were possible beyond those which were taken, as it is probable that the primary thrombosis occurred in the veins in the space between the neck of the bladder and the pubic bone and extended to the femoral vein, from which the embolus was carried to the pulmonary vein.

In Case 6, it is probable that the trauma was caused during the delivery of the child.

In Case 7, a preliminary transfusion of whole blood might have prevented the occurrence of the embolism.

In Case 8, a two-stage operation — cholecystectomy and appendectomy in the first stage and nephropexy in the second — might have prevented the occurrence of thrombosis.

The authors call attention to the fact that during the same period thrombosis did not occur in the cases of 76 patients suffering from extreme anæmia and cachexia who had the spleen, gall-bladder, and appendix removed. In all of these cases, however, the patient was subjected to one or more transfusions of whole blood before the operation was undertaken.

## ANÆSTHESIA

**Berry, M.D., and others: Discussion on Anæsthesia in Operations on the Thyroid Gland.** *Proc. Roy. Soc. Med., Lond., 1920, xiii, Sect. Anæs., 45.*

Berry's experience is based upon nearly 700 thyroidectomies. In the first 60 cases chloroform only was employed. In the next 260 cases the anæsthesia was induced with chloroform, or chloroform-ether, but ether by the open method was used during the rest of the administration. There was one death on the table. This was due to heart failure and occurred shortly after a change had been made from chloroform to ether. The condition was reported postmortem as status lymphaticus. Ether by the open method was employed in the last 260 cases.

In all cases, but especially in those which were very severe, the narcosis was kept very light. A preliminary dose of  $\frac{1}{100}$  gr. of atropine was given. The author seldom uses morphine.

Certain stages of the operation require special care on the part of the anæsthetist. The dislocation of the tumor is a dangerous step in cases of severe dyspnoea, many instances of death at this period having been recorded. It is therefore important that the anæsthesia should be especially light at this time. When the goiter is being dissected out there is often considerable pulling on the trachea. The resulting interference with respiration will be decreased if the surgeon allows free breathing at intervals.

There are two classes of cases in which there is special danger, those with marked tracheal obstruction and those with cardiac trouble. It was taught



formerly that patients with obstruction of the air passages should not be given ether. The author, however, has never experienced any difficulty in administering ether in goiter cases. If it is given slowly it does not cause irritation or produce cyanosis. In cardiac cases in which the heart has become affected by long-standing dyspnoea, cases of true exophthalmic goiter, and those fairly common cases of goiter which are not typically exophthalmic but exhibit cardiac symptoms, the lighter the anaesthesia the better.

The main disadvantage of administering ether by the intratracheal method lies in the difficulty and risk attending the passage of the tube in cases of severe obstruction, especially when the trachea has become displaced and narrowed. The depth of anaesthesia necessary for this procedure is in itself dangerous. Otherwise the method has distinct advantages and produces a light anaesthesia which is easily maintained.

Mr. James Berry took part in the discussion from the point of view of the surgeon. He stated that in all goiter operations he has entirely abandoned the use of chloroform, considering that ether administered by the open method and sparingly is by far the best anaesthetic. The anaesthetist should be on his guard especially in cases in which there are respiratory or cardiac complications. It should be borne in mind that the dyspnoea produced by innocent goiter is due chiefly, if not entirely, to direct pressure upon the trachea rather than to irritation of the recurrent laryngeal nerves. If the exact position and shape of the trachea are known to the anaesthetist, he can often relieve the embarrassment of respiration by slightly changing the position of the head and neck. No doubt there are some cases of exophthalmic goiter which are dealt with best by local anaesthesia, but for the majority of cases Berry believes that light ether anaesthesia is preferable.

Goodall is of the opinion that the performance of any thyroid operation (excepting possibly simple ligation) under any local anaesthetic is undesirable on psychic grounds. The administration of a local anaesthetic containing adrenalin is positively dangerous as it is apt to induce auricular fibrillation and possibly ventricular fibrillation. Ventricular fibrillation has been the cause of sudden death in thyroid operations.

The chief points to which Goodall would pay attention in determining the suitability, or otherwise, of a case for operation under an anaesthetic are: (1) the degree of myocardial exhaustion present; (2) the amount of dilatation; (3) the presence or absence of definite myocardial degeneration; and (4) the height of the systolic blood pressure. In all cases there is a certain amount of myocardial exhaustion. After any operation on the thyroid the blood pressure tends to go up, and may become doubled. Under such increased pressure an exhausted, degenerated, or excessively dilated myocardium may become acutely dilated or fibrillate.

The best cases for an anaesthetic and operative treatment are those in which there is: (1) no definite myocardial degeneration, (2) little myocardial exhaustion or dilatation, and (3) a low systolic blood pressure. Electrocardiographic and X-ray examinations, together with mapping out of the field of cardiac response, are essential for the estimation of the condition of the myocardium.

Low stated that the only cases which require special treatment from the point of view of anaesthesia are those in which the trachea is pressed upon or constitutional symptoms, such as exophthalmos or those indicating a heart condition, are present. The question as to whether a general or a local anaesthetic should be given is still unanswered. In Low's opinion the ideal anaesthetic is either intratracheal ether or oil-ether given by rectum. The next best, he believes, is ether given on a mask, but if this is used the anaesthesia must be kept light throughout the operation. Every precaution is necessary. The condition is serious and therefore anaesthesia should be induced only by a skilled anaesthetist.

ISABELLA C. HERB.

**Rodriguez and Egana: General Anaesthesia** (Sobre anestesia general). *Semana méd.*, 1920, xxvii, 577.

In an extensive article covering the entire subject of anaesthesia the author gives his conclusions as follows:

1. The anaesthetic of choice for minor surgery, short operations, and even extensive operations upon the extremities in which absolute muscular relaxation is not necessary, is nitrous oxide and oxygen. The administration should be entrusted to a skilled anaesthetist. The apparatus used must allow graduation of the amount given and easy regulation of the proportions of the two gases. It should be fitted with a washing bottle to take up impurities, bags for rebreathing as near the mask as possible, and inspiratory and expiratory valves of easy access and management. It should permit the free and rapid change to ether in case of necessity and the heating of the anaesthetic gases. The Gwathmey apparatus is thought to fulfill these requirements best.

2. For all operations in which absolute muscular relaxation is necessary, and especially in abdominal operations, anaesthesia may be induced first with nitrous oxide and then maintained with ether.

3. As regards danger to the patient both during and after anaesthesia chloroform is less safe than ether. When it is given, however, the Esmarch mask and the Roth-Drager apparatus should be used. Chloroform is given best with ether.

4. Open or partially open methods of inducing anaesthesia are better than closed methods. The Julliard or Ferguson mask, the Davis inhaler, or the Obredanne apparatus are all efficient.

5. The induction of anaesthesia by intrapharyngeal insufflation is of value in operations on the neck, face, or cranium, or those performed with the patient in the ventral position. In addition to the fact that



in this way the anæsthesia may be maintained without disturbing the operative field, the method has all the advantages of open anæsthesia and the narcosis may be controlled without any considerable movement of the patient.

6. Anæsthesia induced by intratracheal insufflation is suitable for operations on the thorax in which a high pressure is needed, and for operations on the cerebellum in close proximity to the respiratory center in which it may be necessary to maintain respiration artificially because of respiratory syncope.

7. The induction of anæsthesia with a 5 per cent ether solution given by rectum is of value when combined with local anæsthesia for operations on the face and neck.

8. A preliminary dose of morphine and atropine should be given regularly in all cases before the induction of general anæsthesia.

WILLIAM R. MEEKER.

**Hepburn, W. G.: Stovaine Spinal Anæsthesia.**  
*Am. J. Surg.*, 1920, xxxiv, Anæst. Supp., 87.

Stovaine spinal analgesia has been used in the Montreal General Hospital since 1908 with uniformly satisfactory results.

The properties of stovaine as shown by experiments are: (1) an analgesic action equal to that of cocaine, but without concurrent vasoconstriction; (2) a cardiotonic action; and (3) a bactericidal action.

The solution used in the Montreal General Hospital is prepared in the hospital and put up in 2-ccm. glass ampoules. It consists of 5 gm. of stovaine and 5 gm. of commercial glucose in 95 ccm. of physiological saline solution. It has a specific gravity of 1.031 and a neutral reaction.

The dosage is regulated according to the patient's weight, age, and vitality. The maximum dose is .07 gm., or 1.14 ccm. of the solution, while the minimum dose is .01 gm.

If the operation to be performed requires the anæsthetization of only the sacral roots of the cord, as is the case in operations for hæmorrhoids, fissure in ano, ischiorectal abscess, etc., the injection is made with the patient in the sitting position.

If the lumbar or lower dorsal nerves must be controlled for an abdominal operation or an operation on the lower extremities, the patient lies first in a right lateral position with the head and shoulders raised, if the operation is to be performed on the right side, and in a left lateral position if it is to be performed on the left side. The injection having been made in this position, he is immediately turned on his back and his hips are elevated by means of a bar on the table. The elevation of the hips and shoulders causes the dorsolumbar area to be most dependent. The convexity of the back is altered by raising or lowering the hips. After one minute has elapsed, sensation is tested by means of a sharp needle and the solution is allowed to flow upward to the limit required.

For operations below the level of the umbilicus analgesia is checked when the xiphoid sternum is reached by quickly lowering the hips to the level of the table.

If an abdominal operation is to be performed above this level, the analgesia must be allowed to ascend to the level of the fourth intercostal space anteriorly.

It is most important that the elevation of the head and shoulders should be maintained continuously from the time of the injection until six hours after the operation.

Care must be taken that the head and shoulders are never so low that the stovaine will gravitate upward beyond the dorsal cord as in such case it would produce complete intercostal paralysis and diaphragmatic breathing of diminished rate and depth.

This method of inducing anæsthesia has been found to be most advantageous, and whenever possible is used in cases of diabetes and advanced cardiac, pulmonary, or renal insufficiency.

The analgesia persists for from forty-five minutes to two hours; stovaine has been detected in the spinal fluid twenty-four hours after the injection, and traces of it have been found in the urine after seventy-four hours.

Experiments reviewed by the author suggest an explanation for the depressive action of ether on the blood pressure in shock. It seems probable that even in the normal animal the immediate effect of ether is a depression of the heart. This accounts for the primary fall in blood pressure, but the decreased heart output is soon compensated for by a reflex peripheral constriction and possibly by a distinct stimulation of the vasoconstrictor center by the ether. The pressure thus returns to the normal level where it remains if the etherization is not carried to an extreme degree. A similar depression of the heart occurs in shock but the normal vasomotor reactions are impaired and as the compensatory constriction fails to take place a continued fall in blood pressure results.

There is some evidence that the low blood pressure associated with shock causes a depression of the vasomotor center so that it no longer reacts normally to a fall in pressure. Secondly, there is the possibility that in this condition of ether sensitivity a maximum contraction of the arterioles is already present which prevents the peripheral circulation from compensating for the lessened output of the heart. The increase in the depressive effect of ether immediately after a severe hæmorrhage must be explained on the latter assumption, and possibly also that occurring in the early stages of shock. This theory is supported by a series of experiments recently completed on the perfusion time of normal saline through the vessels of the hind legs of animals during the development of shock. A gradual decrease in the perfusion rate indicated an increased constriction of the peripheral vessels.

ISABELLA C. HERB.



## SURGICAL INSTRUMENTS AND APPARATUS

**Goodloe, A. E.: The Dangers, Failures and Difficulties in Foreign-Body Bronchoscopy; A New Instrument for Their Elimination. *Am. J. Surg.*, 1920, xxxiv, 207.**

Failures in bronchoscopy for foreign bodies may be due to one or more of the following factors:

1. Inexperience in the use of the required instruments.

2. Lack of mechanical skill and ability and of familiarity with the appearance and anatomy of the bronchial tree as seen through a tube.

3. Failure to ascertain previously the size and nature of the body to be removed, its exact location, and the length of time it had been present in the bronchus or elsewhere.

4. The difficulty in seeing through a tube with a lumen which is small and through which a forceps carrier is inserted.

5. The fact that both hands must be used to hold the instrument, one to hold the tube and the other to manipulate the forceps. This requires harmonious action, which necessitates much practice.

6. The fact that in some instances the forceps at first selected will not grasp the object and must then be withdrawn and replaced by another pair. This substitution means a loss of time which often jeopardizes the patient's life.

7. The obscuring of the light at the distal end of the tube by mucus, blood, etc., or by the forceps carrier. A tube with the light reflected from without, at the proximal end, is cumbersome and renders it necessary for the operator to work between the light and the foreign body to be removed.

8. The pushing of the object further down the bronchi, due to the failure of the forceps to pass it successfully because of lack of room or unskillful manipulation.

9. The crushing of the foreign body. As a result of crushing, particles which are too small to be removed are left behind and set up inflammation. This occurs quite frequently when the foreign bodies are of vegetable composition.

The first three obstacles to success enumerated may be overcome by practice and patience. The others may be eliminated, at least in the majority of cases, by the use of the instrument described in this article, the advantages and features of which are outlined as follows:

1. The instrument is a combined bronchoscope and forceps so constructed that it will grasp practically any object of any shape and any size that may find its way into the trachea or bronchi and in the majority of cases does away with the use of forceps of many and various shapes and sizes inserted through the barrel.

2. Vision is had at all times, whether the forceps is closed or open, as no instrument is passed through the barrel.

3. No shadows are cast upon the object on the field of operation or within the barrel.

4. The instrument will grasp and hold almost any object, whether it is hard and round like a glass ball, or soft like a peanut, for it does not depend upon the same principle as other forceps. It has only one thin jaw which passes over the object, closes up the tube behind, and works the object up to the barrel or, if small enough, into the barrel.

5. It is easy to determine when the object to be removed is reached as the forceps can be lifted up and down by the trigger-like motion of the index finger and this will cause the foreign body to move.

6. There is much less danger of driving the foreign body further down into the deeper bronchi than with other bronchoscopes as in this instrument there is only one thin forceps blade, instead of two, to pass the object, and this blade is parallel to the wall of the bronchus.

7. Impacted bodies may be worked loose by a simple up-and-down motion of the forceps blades without disturbing the relation of the forceps blade to the end of the barrel or object.

8. If secretions too thick and tenacious to be drawn through the suction tube obscure the view, they may be pushed aside with the forceps blade.

9. Abscesses with small openings into the lumen of the trachea or bronchi may be opened and enlarged so that pent-up secretions may escape.

10. While the bronchoscope is being withdrawn with the foreign body, it can be seen whether or not the body remains within the grasp of the instrument. This is not possible when forceps are used through the barrel. Often a foreign body has been lost during its withdrawal.

11. By regulating the friction-control screw at the head of the instrument the tension may be regulated so that soft bodies of vegetable composition, such as peanuts and beans, are not crushed. An extra strong grasp may be obtained by reversing the process. Similar regulation may be obtained also with the thumb control without disturbing the screw.

12. Granulating tissue in which the object has become embedded may be curetted away. The shape and size of the forceps, together with its double motion, make it an excellent curette, when necessary, and it is always ready.

13. Because of the mechanical arrangement of the light and the drainage tube, the light is never obscured unless the secretions are exceptionally thick and tenacious. The opening of the drainage tube into the barrel is in the front and at the apex of the light bulb, and therefore the secretion is taken up before it reaches the light. Every part of the tube can be instantly taken apart for cleaning and sterilization.

14. The instrument may be operated with one hand.

15. If the operator should choose to use forceps or hooks, they may be employed in the usual way as the lumen of the instrument is the same in diameter as that of the average sized bronchoscope.

16. The instrument may be employed also for cesophagoscopy.

OTTO M. ROTT.



## SURGERY OF THE HEAD AND NECK

## HEAD

**Pujol, J. T.: Perforating Tumors of the Cranium**  
(Tumores perforantes del cráneo). *Rev. españ. de cirug.*, 1920, ii, 65.

Perforating tumors of the cranium are usually sarcomatous in nature and may arise either from the bone itself or the dura mater. On examination such tumors usually present a regular hemispherical swelling beneath the skin of the scalp. These swellings at first resemble sebaceous or dermoid cysts. Occasionally the loss of bone cannot be detected by physical examination and when extirpation of a supposed cyst is attempted a severe hæmorrhage results. An X-ray examination is therefore of great value.

Perforating tumors of the cranium are usually soft and in some cases may be reduced within the cranial cavity. The increase in size takes place also within the cranial cavity and thus increases the intracranial pressure. The blood supply is very rich, often presenting a cavernous aspect.

When a tumor arising from the dura mater reaches considerable size without perforating the cranium, the bone symptoms of local or general cerebral compression are produced. In the author's cases there were no symptoms of increased intracranial pressure, the perforation of the cranium acting as a decompressive trephining. The usual physical signs are the presence of a soft tumor surrounded by a hard bony border which is elevated or possesses spines which extend within the tumor. The tumor may be reducible but upon reduction symptoms of cerebral compression are produced. A palpable pulsation is sometimes present and there is usually a palpable increase of pressure on strong coughing. Radiographic examination of the skull will reveal the bony defect. It is generally believed that these tumors are of rapid course, but the author's experience has been to the contrary.

The surgical treatment may be relatively easy when the tumor is localized, not adherent to the brain, and easily accessible, and the dura mater is intact and resistant to perforation. In one of the author's cases the tumor had undermined the dura and involved the sinus rectus so that extirpation was impossible. The orbit also may be invaded by such tumors.

The usual surgical procedure is extirpation of the tumor mass entire, including the bone and dura a short distance from the neoplasm. In certain cases the skin and scalp tissues also must be removed, although as a rule the tumor is limited by the scalp tissues so that the skin at least may be preserved. In cases in which the skin has been preserved no recurrence of the tumor at this level has been noted. Bone and dura mater cannot be readily included together in the extirpation because of the difficulty of securing hæmostasis in the dura. The tumor

usually includes both dura and bone, however, and it is not possible to separate these at the site of the neoplasm. The author usually cuts the cranium well out from the tumor, leaving a narrow zone of healthy bone surrounding the growth. The dura may be easily separated here, and after ligation of vessels may be sectioned a short distance from the edge of the bone.

The details of four cases are given and the author's technique is minutely described. The article contains many photographs of cases before and after operation and X-ray plates of the skulls.

WILLIAM R. MEEKER.

**Kroh, F.: Studies Regarding the Relation between the Spinal Fluid and the Medulla Oblongata After Recent Gunshot Injuries of the Skull**  
(Studien ueber das Verhalten des Liquors und der Medulla Oblongata bei frischen Schaedelschuessen). *Beitr. z. klin. Chir.*, 1920, cxix, 1.

The presence of blood in the spinal fluid indicates some intracranial change, and an increase in pressure combined with an increased albumin content of the clear fluid indicates some damage to the central nervous system, especially the membranes. It must be borne in mind, however, that the pressure of the spinal fluid may be increased also by such factors as bending the head, struggling, an increase in the rate of respiration, and crying during the spinal puncture.

The author discusses 77 cases of skull injuries which he divides into four groups. Group 1 included 11 cases of slight injury to the skull with symptoms of serious traumatic meningitis, i.e., increased intracranial pressure and increased albumin content. Group 2 included 29 cases in which the pressure of the spinal fluid was increased and the fluid contained blood but there was no fracture. In Group 3 were 28 cases with symptoms of increased pressure, bloody fluid, and an open skull fracture. In Group 4 were 3 cases in which the spinal fluid and operative findings were negative.

It is evident that increased blood pressure does not necessarily result in higher spinal fluid tension, but that a high blood pressure, like a low pulse rate, is a symptom of injury to the medulla. The classical symptoms of a pathologic condition of the medulla are loss of consciousness, changes in the pulse and respiration rates, increased blood pressure, and vomiting. Kroh's conception of brain compression as ordinarily understood is that the medulla reacts to some irritation produced mechanically as by compression or by a disturbance in the circulation as in anæmia or ischæmia. There is a certain relationship between the pressure of the spinal fluid and the circulation in the two jugular veins. Therefore any factor which impairs the circulation (e.g., strangulation, torsion, compression) causes a prompt increase in the pressure of the spinal fluid. On the other hand, compression of the carotids causes the



normal and pathologically increased pressure to fall. Sometimes also the pulse is slowed, the respiration becomes deeper, and the pupils are dilated, while in a few cases there is loss of consciousness or clonic epileptiform convulsions. By this experimentally produced arterial ischaemia of the normal brain a condition resembling *commotio cerebri* has been brought about.

The lowered pulse rate after spinal puncture the author explains as follows:

Spinal puncture relieves the pressure in the spinal canal, and if the pressure of the fluid in the subarachnoid spaces of the brain is unchanged the base of the brain, especially the medulla, sinks back into the foramen magnum and presses against the hard bone. In this way the circulation of the brain is cut off, i.e., an ischaemia results from the pressure of the medulla on the blood vessels.

The correctness of this theory remains to be demonstrated by systematic measurements of the pressure of the spinal fluid immediately after contusions of the brain. Low pressures will confirm it.

Borr (Z).

**Demmer, F.: The Indications for the Removal of Foreign Bodies from the Brain** (Zur Indikation der Fremdkörperoperation im Gehirn.) *Wien. klin. Wchnschr.*, 1920, xxxiii, 55.

This is a valuable treatise, a continuation of studies begun at the front dealing particularly with penetrating wounds of the brain. The generally poor results frequently observed late in the after-treatment of such cases after an apparently favorable early result are analyzed on the basis of autopsy findings and illustrated by one of the author's cases.

A wound of the brain due to the penetration of a foreign body rarely heals without a reaction. In most cases encephalitic softening remains latent around the foreign body or the bullet canal for some time and then suddenly flares up near the periphery or bursts into the ventricles. Such foci are found not only around the foreign body but also around the wound canal.

During the primary wound period and after operations for the removal of a foreign body too rapid healing must be prevented. Reasoning from the premise that even apparently mild symptoms produced by a penetrating wound of the brain which has been healed for a long time reveal the presence of an encephalitic focus, the author concludes that operation should be performed more frequently in such cases. Whenever a reactionless healing (encapsulation) takes place, manifested by the absence of definite symptoms, Demmer subjects the patient to motor, psycho-energetic, and dietetic functional tests, and discharges him only when these have been gradually made more severe for a period of weeks under excessive mental and bodily strain and have been tolerated without any untoward symptoms. Otherwise he believes the removal of the foreign body is indicated.

O. FRISCH (Z).

**Ochsner, A. J.: Endothelioma of the Brain.** *Surg Clin. Chicago*, 1920, iv, 711.

Nine months before admission to the hospital the patient, a man 27 years of age, woke up one morning with a feeling of numbness in his right hand and arm which was associated with twitching in the right side of the face and thickness of speech. The twitching in the face disappeared after four or five minutes, and the numbness in the arm and the thickness of speech in about four hours. The sensation in the hand never returned completely.

At one-month intervals the patient continued to have other attacks which were similar to the first except that speech was not affected. One month before operation he had convulsions in the right arm. These began by twitching of the fingers of the right hand, which gradually extended to the right arm. As the convulsion progressed the arm was drawn up over the head. When the arm was fully drawn up over the head he lost consciousness. During the convulsion he frothed at the mouth and held his breath, but no other part of the body took part in the twitching. Before admission to the hospital he had been spitting blood which seemed to come from the nose or sinuses. His eyes were blood-shot. In the beginning the attacks involved only the right arm, but later they extended up the right arm and down the back on the right side.

On examination the pupils were found to be equal and reacted to light and accommodation. The sclera showed innumerable subconjunctival hæmorrhages. There was slight horizontal nystagmus on both sides. The neurological examination was negative except for a diadokokinesis and an astereognosis for small objects in the right hand. Motor, sensory, and cranial nerves, and co-ordination and Wassermann tests were negative.

From the history and findings it seemed evident that the condition was due to an irritating lesion in the region of the left precentral convolution in the region of the arm center. The most common tumors producing such a lesion are endothelioma, glioma, tuberculoma, gumma, and cyst. The negative Wassermann test on three occasions ruled out syphilis.

The patient was operated on under ether anaesthesia. The incision was made so as to expose the fissure of Rolando. Careful palpation revealed in the middle of the fissure of Rolando an area about the size of a half-dollar which was firmer than the rest of the brain. Two silk sutures were inserted through this area and held taut while the dura was incised between them and a grooved director inserted. The dura was then incised at each corner, so that a cross-shaped incision was made.

This anterior flap of dura was elevated with great difficulty. When the dura was peeled off a gray area about 2 in. in diameter, which was rather firm to palpation, was revealed. The tumor was excised and a fascia flap taken from the right leg was sutured over the area from which the dura was removed.



The bony flap was then dropped back into place and sutured with interrupted silkworm-gut sutures.

The day following the operation the patient had motor aphasia and paresis of the right arm and right side of the face. This condition gradually cleared up, however, so that three weeks after the operation he was able to talk fairly well, had a fairly good grip in his hand, and was able to be up and around. Microscopic examination of the growth showed it to be an endothelial tumor.

GEORGE W. HOCHREIN.

**Kanavel, A. B.: Tumors of the Face.** *Surg. Clin. Chicago*, 1920, iv, 731.

Kanavel gives the histories of three patients with tumors of the face and discusses the embryology and pathology of facial tumors.

Dermoid tumors are very common in the face. Epiblastic tissue is frequently "turned in" to result at a later period in the development of a tumor, especially in the line of fusion.

Certain tumors of the face, such as hæmangioma and lymphangioma, which occasionally occur about the angle of the mouth and upon the lips, are due to over-development of tissue normally present.

Of the tumors of the jaw which appear as a result of abnormal development of the foetus the most common is the odontoma. Epithelial odontoma, adamantinoma, and adenocarcinoma appear in young adults, most frequently near the angle of the jaw. They may begin near the alveolar border and project from it, or have their origin within the body of the jaw and cause a diffuse enlargement which in some cases may extend from the angle to the symphysis.

Of the tumors which have no definite relation to embryological development the most common is sarcoma of the jaw. Those developing from the bone-marrow are usually benign giant-celled tumors. The malignant round-celled or spindle-celled variety occurs less frequently. Mixed tumors, fibrosarcoma, chondrosarcoma, osteochondrosarcoma, and lymphangiosarcoma, are not uncommon.

If a tumor develops from the bone, involvement of the nerve resulting in severe pain is not uncommon and this is an important symptom.

There is no site of predilection for sarcoma or carcinoma. Growths involving the antrum are more apt to be sarcomatous than carcinomatous.

A somewhat different type of tumor is a growth which rather commonly involves the salivary glands, particularly the parotid and submaxillary glands. This type belongs to a class known as mixed or complex tumors, new growths containing a considerable variety of tissues such as cartilage, myxomatous tissue, fat, and lymphoid structures generally considered of mesoblastic origin and, in addition, cells resembling epithelial, endothelial, or connective-tissue cells from which they are known as epithelial, endothelial, or sarcomatous growths.

In operations upon these cases the resection should extend beyond the limits of the tumor. In

other words, if the tumor has grown down to the bone it is wise to remove a section of the bone, and, in aggravated cases, the entire involved maxilla in order to go well beyond all of the tumor growth. When possible the upper table of the superior maxilla should be preserved to prevent prolapse of the eye.

The mortality following operations for facial tumors is much less than might be expected. Following primary ligation of the external carotid and careful administration of the anæsthetic through a tube, a satisfactory recovery follows. Operation should be performed in all cases in which there is any possibility of removing the growth.

HOWARD A. MCKNIGHT

**Cushing, H.: The Rôle of Deep Alcohol Injections in the Treatment of Trigeminal Neuralgia.** *J. Am. M. Ass.*, 1920, lxxv, 441.

From 1847 to 1907 various substances were injected to control neuralgia. In 1907 a number of articles appeared upon the use of alcohol in the treatment of trifacial neuralgia. The procedure has its limitations. Relief is temporary and each successive injection affords a shorter interval of relief, a fault shared also by peripheral operations. Misplaced alcohol injections may produce great damage. Oculomotor nerve paralysis, locking of the jaw from infiltration and subsequent fibrosis of the pterygoid muscles, paralysis of the motor fifth, sloughing of the nasal bones with subsequent ozena, all have been seen. Accidental injection of the middle ear may result in labyrinthine trouble.

From a large number of cases the author draws the following conclusions:

Deep extracranial injections of alcohol into the maxillary and mandibular nerve trunks near their foramina of exit have completely superseded peripheral neurectomies. In neuralgias limited to one of the two lower divisions, alcohol injections represent the treatment of choice. When the neuralgia has spread beyond the original area and involves that supplied by the adjacent division, a trigeminal neurectomy must be considered. Since the results obtained by a trigeminal sensory root avulsion are perfect and permanent, the prolonged and repeated use of injections in refractory cases which involve more than one division is to be deplored.

ISADORE E. BISHKOW.

**Cushing, H.: The Major Trigeminal Neuralgias and Their Surgical Treatment Based on Experiences with 332 Gasserian Operations. I. The Varieties of Facial Neuralgia.** *Am. J. M. Sc.*, 1920, clx, 157.

Cushing describes at length the five types of facial neuralgia which may be mistaken for trigeminal neuralgia: those ascribed to the sphenopalatine ganglion, those secondary to zoster, those attributed to the geniculate ganglion, those occurring in certain cases of convulsive tic, and, lastly, those due to the involvement of the trigeminus by tumors. Minor



trigeminal neuralgias are to be differentiated from major trigeminal neuralgias. For the latter the gasserian operation, the author believes, is unquestionably the proper therapeutic procedure.

In the five types of pseudotrigeminal neuralgia which may be mistaken for trigeminal neuralgia there is every reason to refrain from a trigeminal neurectomy if possible.

The article is illustrated and the histories of cases of the different forms of neuralgias are given.

HOWARD A. MCKNIGHT.

**Ferrarini, G.: The Treatment of Fistulæ of Stenon's Duct, and Especially the Operation of Disinnervation of the Parotid Proposed by Leriche** (Sulla terapia delle fistole del dotto di Stenone ed in particolare sull' operazione di disinnervazione della parotide proposta dal Leriche). *Arch. ital. di chir.*, 1920, ii, 207.

For several years Ferrarini has been investigating the possibility of creating collateral escape for the secretion of the parotid gland. In this work he has studied the method of treating salivary fistulæ of Stenon's duct and especially the method of disinnervating the parotid gland practised by Leriche.

Most of Ferrarini's studies have been made on dogs, but he has performed Leriche's operation in several clinical cases.

From his animal experiments the author draws the following conclusions:

1. Section of the secretory nerve causes a diminution in volume of the parotid or submaxillary gland so that after a month or so it is reduced to one-third its normal weight. Such diminution appears to continue subsequently.

2. Simple atrophy occurs in the zone contiguous to the gland. Epithelial necrobiasis is rare.

3. Edema and an increase in thickness of the interstitial connective tissue occurs but there is no true sclerotization of the glandular parenchyma.

4. The lesion is transitory and attains its maximum about a month or a month and a half after the operation.

A complete and permanent recovery resulted in all the clinical cases in which the Leriche operation was done.

From these facts Ferrarini concludes that Leriche's operation is of great value in the treatment of rebellious fistulæ of Stenon's duct. From the physiopathological viewpoint, however, the effect of disinnervation of the parotid upon the quantity and quality of the salivary secretion is still to be determined.

The author refers to the recent revival by Morestin in France and by Donati in Italy of Viborg's old method of treating fistulæ of Stenon's duct by ligation and burial of the central stump of the duct. Although Morestin's results in 32 clinical cases were certainly most excellent, Ferrarini points out that a very large number of such cases tend to become cured spontaneously and therefore in many of Morestin's cases the result may not have been due

to the operation. Viborg's method is not a simple procedure and is absolutely contra-indicated when infection is present. Leriche's method is not contra-indicated by sepsis. To date there is no method, and in Ferrarini's opinion it is probable that there never will be a method, of treating Stenon's fistulæ which can be applied to all cases. The choice of operation must be based upon the requirements of the particular case.

The operative procedures to which surgeons should give their approval are: ligation after complete isolation of the duct for cases in which infection is present and the duct is not embedded too extensively in cicatricial tissue; the DeSault puncture for cases of buccal fistulæ; and Leriche's disinnervation method for cases of infected, old, rebellious or adherent fistulæ behind the masseter muscle.

WILLIAM A. BRENNAN.

## NECK

**Thompson, J. E.: The Relationship Between Ranula and Branchiogenic Cysts.** *Ann. Surg.*, 1920, lxxii, r64.

An analysis of a series of cases of ranula associated with submaxillary cyst and cyst of the upper deep cervical region identical in anatomical structure and contents leads to the inference that these cysts have a common origin and probably result from fragmentation of a mother cyst.

The origin of the mother cyst is ascribed to the "cervical sinus" which is developed in connection with the external cleft depressions of the second, third, and fourth branchial clefts. This is carried from its original position by the migration and re-arrangement of the muscles of the neck during the development of the palate, pharynx, and tongue, and by the same agency is split up into several parts which lie in the upper cervical, submaxillary, and lingual regions. The muscles mainly responsible for this are those derived from the third and fourth branchial arches and those derived from the seventh, eighth, and ninth body segments behind the arches supported by the hypoglossal nerve.

Complete branchial fistula usually results from the persistence of part of the cervical sinus combined with perforation of the second cleft depression. The third cleft depression is very rarely perforated and the fourth practically never. A fistula passing into the pharynx through the second cleft depression always courses upward above the fork of the carotids above the glossopharyngeal nerve and opens into the tonsillar recess. A fistula passing through the third cleft depression passes upward below the fork of the carotids, between the glossopharyngeal and superior laryngeal nerves, and opens into the sinus pyriformis. A fistula passing through the fourth cleft depression passes downward, hooks around the subclavian artery on the right side or the aorta on the left side, and finally courses upward beneath the superior laryngeal nerve to reach the sinus pyriformis.



**DeGastano, L.: Congenital Cysts of the Neck** (Sulle cisti congenite del collo). *Riforma med.*, 1920, xxxvi, 401.

Two cases of cysts of the neck treated surgically are reported. The patients were women 20 and 21 years of age respectively.

The author states that the clinical classification of congenital cysts of the neck into dermoid and amygdaloid cysts is not correct. He suggests the following anatomico-clinical classification: (1) suprahyoid cysts, those which arise in the space between the hyoid bone and the floor of the mouth; (2) thyrohyoid cysts, those arising between the thyroid and the hyoid bone; and (3) subthyroid or suprasternal cysts, those which arise in the space between the thyroid and the sternum. By a sub-classification they may then be grouped as median or lateral cysts.

The anatomohistologic classification of such cysts comprises:

1. Ectodermic cysts, those arising from pavement epithelium with corneal layers and cutaneous formations.

2. Endodermic cysts: (a) with cylindrical epithelium and showing embryonic characteristics; and (b) with pavement epithelium and showing evolutionary changes.

Cysts arising in the median line of the thyroglossal duct may be divided into: (1) cysts with cylindrical epithelium showing embryonic characteristics; and (2) cysts with thyroid tissue showing evolutionary changes.

In the two cases reported by the author the cysts were diagnosed clinically as median, subthyroid or suprasternal congenital cysts. The histologic examination showed the first to be an ectodermic cyst and the second a cyst and fistula originating in the thyroglossal tract.

The detailed clinical and histologic study of such congenital cysts is considered by De Gastano to be of importance in connection with the embryology of the neck.

WILLIAM A. BRENNAN.

**Weise, H.: Gunshot Injuries of the Common and Internal Carotid Arteries and Their First Treatment** (Ueber die Schussverletzungen der Arteria carotis communis, der Carotis interna, und ihre primäre Behandlung). *Beitr. z. klin. Chir.*, 1920, cxix, 160.

The anatomical and clinical picture of gunshot wounds of the common carotid is described. The author discusses 15 cases from the recent literature in which aneurisms of the common or internal carotid developed weeks or months after the injury. Death or severe brain disturbances resulted in 53.33 per cent; recovery in 46.67 per cent. Secondary suture in cases of aneurism of the injured common carotid resulted in recovery in 92.86 per cent. Of fifteen instances in which the injured carotid was primarily ligated, recovery resulted in 33½ per cent. A cure was obtained also in 2 cases treated by Rehn with primary suture.

Rehn divides the carotid artery into three parts: the first extending from its beginning up to its division into the internal and external branches; the second consisting of the point of division itself; and the third extending from the beginning of the internal carotid to its entrance into the skull where a branch is given off to the digastric muscle. The suture he employs is that used by Carrel. The sutured vessel is buried in the neighboring soft parts and a dressing then applied. When, because of relaxation, the defect in the carotid cannot be overcome, it is bridged with the aid of the external carotid. This procedure is illustrated by two plates. The internal carotid is exposed by a diagonal incision in the neck, a cross section under the jaw anterior to the angle of the jaw, exposure of the parotid and temporary oblique division of the lower jaw. The superficial temporal, the occipital, the posterior auricular, and when necessary, the external carotid are divided and double ligated high up. The styloid process is freed and with it the insertion of the styloglossus and stylo-pharyngeus muscles is drawn forward. When necessary, the proximal stump of the external carotid is sutured to the distal stump of the internal carotid.

As an immediately fatal hæmorrhage may occur from an unrecognized wound of the carotid, primary ligation of the large vessels of the neck should be done by the field surgeon.

G. SCHMIDT (Z).

**Klose, H.: The Acute Inflammations of the Thyroid; Their Etiology, Course, and Surgical Treatment** (Die akuten Entzündungen des Kropfes; Aetiologie, Verlauf und chirurgische Behandlung). *Berl. klin. Wchnschr.*, 1920, lvii, 202.

This article is based on a large number of cases of inflammation of the thyroid gland due to local infection or the presence of suppurating foci elsewhere in the body which were observed during the war. Klose points out that formerly thyroiditis and strumitis were differentiated. He agrees with Kocher, who never saw a case of pure thyroiditis, that an acute infection attacks only glands which have undergone pathologic change or are predisposed to infection because of nodular degeneration. In strumitis nodosa this is especially true on account of the meagerness of the blood supply of the tumor tissue and the hæmorrhagic infiltration and degeneration due to atherosclerosis of the capsular vessels. In this condition the bacteria find a suitable soil for development and may remain dormant or become active at any time.

Klose differentiates between goiters of mountainous regions and those of the lowlands. On account of the size of the nodules and degenerations, the former are especially susceptible to infection. The infection enters almost exclusively by the hæmatogenous route.

The acute infections are due to pneumococci, anaerobic bacteria, streptococci, staphylococci, and, more rarely, to the typhoid bacillus, while the protracted or intermittent types are caused by the



bacteria of typhus, malaria, and influenza. The former require early surgical intervention whereas the latter at times may be treated by internal medication. Spontaneous cure may occur but in some cases such a cure may be only apparent. Typhoid bacilli or pneumococci may become encapsulated in a nodule and remain dormant for years. Eventually suppuration may break through and lead to the formation of a fistula. Rupture into the œsophagus, trachea, or mediastinum is dangerous and often fatal.

PLEUZ (Z).

**Mayo, C. H.: Adenoma with Hyperthyroidism.**  
*Ann. Surg.*, 1920, lxxii, 134.

The report from the Surgeon General's Office on the physical condition of the first million draft recruits made us appreciate that we have actual goiter regions in America. Goiter is most prevalent in the northwest states and next most prevalent in the Great Lakes region. In some of the southern states and in the New England states it is rare.

The condition shown by Plummer to be adenoma with hyperthyroidism has been described in foreign clinics as atypical exophthalmic goiter and the cases subdivided by various authorities into more or less ill-defined groups designated as cases of secondary morbus Basedow (Gautier and Buschan), formes frustes or incomplete goiter (Marie), goiter heart (Kraus, Gittermann and Stern), sympathicotonic and vagotonic goiter (Eppinger and Hess), goitre basedowifié (Marie), and Basedowized goiter (Kocher). These groups include psychoneurosis, early exophthalmic goiter, and hyperthyroidism from adenoma.

The essential points in the clinical differentiation of exophthalmic goiter and adenoma with hyperthyroidism as presented by Plummer in 1913 are:

1. The difference in the average ages of the patients when the goiter was first noticed. Enlargement of the thyroid was noted from five to ten years earlier in life by the patients with non-hyperplastic goiter than by those with hyperplastic (exophthalmic) goiter.

2. The time elapsing between the appearance of the goiter and the onset of the symptoms of hyperthyroidism. In cases of exophthalmic goiter the symptoms of hyperthyroidism followed the appearance of the goiter within an average of nine-tenths of a year, while in cases of non-hyperplastic adenoma with hyperthyroidism an average of fourteen and one-half years elapsed before they developed.

3. The relative frequency of exophthalmos in exophthalmic goiter contrasted with its absence in cases of non-hyperplastic adenomata with hyperthyroidism.

Exophthalmos occurs within three months of the appearance of hyperthyroidism in an average of 50 per cent of the cases of exophthalmic goiter, and within two years in 87 per cent. Exophthalmos even of questionable degree was rarely noted in cases of non-hyperplastic adenoma with hyperthyroidism. Such cases average from 17 to 20 per cent of the

cases ordinarily classified as exophthalmic goiter. The condition is a distinct disease entity and should have its own classification.

Toxic adenoma is now called "adenoma with hyperthyroidism," having been classed with simple goiter since 1911 when Plummer discussed the condition at the meeting of the American Medical Association.

Up to January, 1920, the surgeons of the Mayo Clinic performed 9,613 operations for simple goiter, including thyrotoxic adenomata, and 10,135 operations for exophthalmic goiter. Previous to 1912 thyrotoxic adenomata were included with exophthalmic goiter. Many of the patients with exophthalmic goiter were subjected to more than one operation, such as ligation, before resection. Thyroid adenoma with hyperthyroidism is a disease associated with adenoma which is characterized by an increased metabolic rate and excited by an excess of the normal thyroid hormone in the tissues. It is clinically evidenced by nervousness, tremor, tachycardia, etc. The symptoms appear gradually and insidiously, usually becoming definitely worse about one year before the patient appears at the clinic. Later symptoms are an increase in nervousness and mental instability, moderate tremor, loss of strength, and dyspnoea on exertion; the heart beats rapidly and hard but the beat is not so accentuated as in exophthalmic goiter. In the long-standing and more severe cases there is evidence of cardiac insufficiency with more or less œdema of the legs and ankles, often accompanied by myocardial disintegration which is shown by irregular rhythm due to the premature contractions or auricular fibrillations. Exophthalmos and gastro-intestinal crises, noted in exophthalmic goiter, are absent.

The average age of the patients with adenoma with hyperthyroidism at the time of the examination in two groups of 201 and 75 cases was 47.7 and 47.4 years, respectively. Seventy-seven per cent were more than 40 years old. In cases of thyrotoxic adenomata a goiter is present eighteen to nineteen years before the patient comes for operation and the symptoms of hyperthyroidism have been present about three and one-half years, twice as long as even the enlarged gland has been noticed in cases of exophthalmic goiter.

**Frazier, C. H.: The Management of Toxic Goiter from the Surgical Point of View.** *Ann. Surg.*, 1920, lxxii, 155.

The author's mortality in resection for toxic goiter during the past five years was only 1 per cent and a fraction. This article is based upon a series of 339 cases.

The adrenalin test has been found of very little aid as negative reactions occurred even when a typical exophthalmic syndrome was presented. The determination of the degree of toxicity is one of the most practical problems of the surgery of toxic goiter. The basal metabolism is determined by the new Benedict apparatus. Metabolic studies



make possible a fairly accurate differential diagnosis between true hyperthyroidism and simple neurasthenia and therefore should be made routinely. As a general rule, severe cases have a basal metabolism running from 66+ upward, while that of moderately severe cases varies from 45+ to 65+ and that of mild cases is below 45. Every patient should be kept under observation for at least a week, preferably two weeks. For practical purposes an elaborate classification of the toxic cases is not essential. Rest is helpful in the preparation of patients for operation but will reduce the basal metabolic rate only from 10 to 15 per cent.

In the extremely toxic cases X-ray therapy is prescribed, but the results have not been altogether satisfactory. Such treatment should be employed chiefly in cases in which there is some suspicion of enlargement of the thymus.

In order that surgical procedures should not be brought into disrepute they should not be applied to the following types of cases: (1) cases of neurasthenia with enlargement of the thyroid; (2) mildly toxic cases of adolescence in which not less thyroid tissue but more iodine is needed; (3) thymic cases; (4) cases in the terminal stage of the disease; and (5) cases of hypothyroidism.

Every crisis of hyperthyroidism leaves the patient a poorer surgical risk. Preliminary ligation should be done when there is the least doubt as to the propriety of resection. Frazier prefers single ligation to double ligation done at one- or two-week intervals. As a rule he ligates first when the metabolic rate is over 60 and when, in cases of a lower metabolic rate, the other signs of great toxicity are present. The ligation is done in the patient's room under "anoci" technique, and the superior pole is divided between two ligatures. Resection should follow in two or three months, at which time the maximum improvement is noted.

The ultimate and total result of surgical interference follows the resection of the gland. The author performs the resection under nitrous oxide anaesthesia with "anoci" technique. Local anaesthesia is contra-indicated. The measure of success in the surgical treatment of hyperthyroidism varies directly with the amount of tissue removed.

Of the patients heard from before the war, 80 per cent had recovered, either altogether or sufficiently to enable them to resume their occupations.

CARL R. STEINKE.

**Judd, E. S.: The Results of Operations for Adenoma with Hyperthyroidism and Exophthalmic Goiter.** *Ann. Surg.*, 1920, lxxii, 145.

The two types of goiters with hyperthyroidism which produce definite clinical syndromes are exophthalmic goiter, in which the symptoms are characteristic, and adenoma with hyperthyroidism. A third type which is frequently confused with the other two consists of the mildly toxic adolescent goiters which are usually temporary or respond to treatment.

This study covers a group of 100 consecutive cases of exophthalmic goiter in which operation was done in 1914, and 100 consecutive cases of adenoma with hyperthyroidism in which operation was done in 1917 and 1918. The six years which have passed since the operations performed in the first group seem sufficient to demonstrate the success or failure of the surgical procedures. The group of cases of adenoma with hyperthyroidism were chosen from 1917 and 1918 because a study of the metabolic rates had been made in all instances; the average time which has elapsed is two years. The results of the study indicate that partial thyroidectomy cures at least 65 per cent of the cases of hyperthyroidism, even those of the more severe types, and at least 80 per cent of the cases of adenoma with hyperthyroidism.

**Crile, G. W.: Toxic Adenoma in Relation to Exophthalmic Goiter.** *Ann. Surg.*, 1920, lxxii, 141.

Clinical evidence of the functional activity of adenomata is found in the frequent development of symptoms identical with those which are characteristic of exophthalmic goiter and in the disappearance of these symptoms after the removal of the adenoma. In hyperthyroidism due to hyperactive adenomata, either iodine or thyroid extract may cause an aggravation of the symptoms. With the exception of exophthalmos, all the characteristic symptoms of true exophthalmic goiter may be present in cases of "toxic adenoma."

If in a case of true exophthalmic goiter the gland is not hyperplastic, but an adenoma is present, the removal of the adenoma relieves the patient in exactly the same way and to the same degree as the removal of the hyperplastic gland. The removal of the adenoma gives relief also in those cases in which the basal metabolism, the appetite, and the sensitization to adrenalin are not increased, but myocarditis, a high blood-pressure, or neurasthenia is present.

It would seem, therefore, that the various types of goiter should be regarded as varying degrees of the same or similar processes and that, certainly as far as treatment is concerned, no differentiation should be made between exophthalmic goiter with hyperplasia or thyrotoxicosis and adenomata.

The principles and development of the author's treatment are based on his experiences with 2,477 cases of thyroidectomy which included 1,306 cases of exophthalmic goiter.

CARL R. STEINKE.

**Aikins, W. H. B.: Radium in Toxic Goiter—Its Treatment.** *Med. Press*, 1920, n. s. cx, 25.

This article records the author's experience with 100 cases of toxic goiter. Aikins agrees with Knox that radiation should be supplemented by: (1) rest in bed, (2) dietetic treatment, and (3) treatment with drugs.

The best results are obtained with the deeply penetrating rays. The radium is so screened that the short rays are cut off. In this way the superficial



skin reaction is minimized, but the deeply penetrating rays are allowed to act upon the thyroid tissue.

Advanced cases with severe goiter symptoms the author treats in a hospital with relatively heavy doses, while the less severe cases he treats in the office with smaller dosage. The first course of treatment is usually the heaviest, the dosage varying between 150 and 360 milligram hours according to the severity of the disease. Subsequent treatments range from 50 to 150 milligram hours, depending upon the patient's progress.

According to Boggs, the X-ray treatment of the type of goiter which occurs during adolescence and does not disappear spontaneously is followed by distinct improvement. The cosmetic effect is pleasing, there is a gain in weight and strength, and the psychic state is considerably improved.

The results obtained with the X-ray and radium are about the same, but radium therapy has the following advantages: (1) the absolutely constant emission of the rays makes possible exact dosage; (2) the penetration of the tissues is much greater; (3) no noisy exciting apparatus is necessary; and (4) the application may be made easily.

Aikins reports three groups of cases treated. The first included cases of the mild toxic goiter of adolescence, the patients being young girls about 15 years of age. The doses of radium used varied between 464 and 753 milligram hours. In almost every case there was marked general improvement, the weight and strength increased, the gland diminished in size, and the goiter symptoms were greatly relieved.

The second group included cases of enlarged glands with grave symptoms of toxic goiter. These patients, whose ages varied from 19 to 55, presented the usual history and clinical picture of toxic goiter. From 650 to 1100 milligram hours of radium were given. In every instance there was marked improvement: the pulse dropped from between 125 and 140 to between 70 and 96; the tremor diminished or disappeared; the eye symptoms practically disappeared; the weight increased; and the general condition became decidedly better. In the third group of cases, which was similar to the second, there was little or no enlargement of the thyroid gland. The results obtained in this group were as gratifying as those secured in the second.

W. L. BROWN.

## SURGERY OF THE CHEST

### CHEST WALL AND BREAST

**Lee, B. J., and Adair, F.: Traumatic Fat Necrosis of the Female Breast.** *Ann. Surg.*, 1920, lxxii, 188.

Lee and Adair report two cases of fat necrosis, giving the clinical, operative, and pathologic findings.

In gross appearance one case showed a rather large area of opaque discolored fat which, along one side, was sharply outlined from the normal fat tissue, but failed to show the positive signs of carcinoma. In the other case there were two abnormal areas, one of necrotic fat, the other cicatricial in appearance but fairly well encapsulated and without the opaque texture and chalky points and streaks of carcinoma.

Both patients gave a definite history of trauma. The breasts increased rapidly in size and exhibited the same skin adherence seen in malignancy. The consistency of the tumors resembled that of carcinoma. Neither patient experienced any pain. In one case there was definite fixity of the tumor to the underlying muscles.

The diagnosis may be made from the gross appearance of the tumor. HENRY J. VANDEN BERG.

**Jackson, J. N.: The Technique in Operations for Cancer of the Breast.** *Ann. Surg.*, 1920, lxxii, 181.

All infected tissue must be removed within the limits of reasonable surgical access.

Dissemination of the infection during operation and contamination of the wound by escaping cancer cells must be prevented.

A wide area of skin, the entire mammary gland, and the pectoral muscles, with the exception of the

clavicular portion of the pectoralis major, must be removed as well as all lymph-bearing structures in the axilla. The author prefers postoperative raying of the subclavian triangle rather than the dissection of this space. He does not believe that many American surgeons remove the fascia of the rectus as advocated by Handley.

In order to prevent dissemination, the radical operation is begun in the axilla, the lymph vessels being divided at their highest point before the breast is handled. The lymph vessels leading to the thorax are also divided early in the operation.

To prevent contamination the author covers the flaps with hot gauze pads and, before suturing, irrigates the wound with a stream of water and mops it lightly with gauze.

The preservation of the function of the arm after operation is important. The author describes his two methods of incising. He obliterates the axillary fossa by bringing the skin from the under side of the pectoralis major up to a longitudinal incision in the line of the arm, covering the vessels singly. The wound is dressed after the operation with the arm at a right angle, and early passive motion is instituted.

HENRY J. VANDEN BERG.

**Meyer, W.: Late Results after Radical Operation for Cancer of the Breast.** *Ann. Surg.*, 1920, lxxii, 177.

The author reports the cases of six patients who are alive and well from twelve to twenty-five and one-half years after operation for cancer of the breast, and of four others who remained free from recurrence for four, six, eight, and sixteen years and then



died from other diseases. These results, Meyer believes, prove that the radical operation may be curative.

Poor results are due to the fact that operation was not performed until the condition had reached an advanced stage or the agent responsible for the carcinoma was highly virulent. For these reasons statistics are of little value.

Involvement of the supraclavicular glands is not a contra-indication to operation. In Meyer's opinion it is the surgeon's duty to operate when such involvement is present.

The radical operation as done by Meyer is begun in the axilla and continued toward the sternum. The lymph nodes and axillary fat are removed before the cancerous breast itself is handled.

HENRY J. VANDEN BERG.

### TRACHEA AND LUNGS

**Jean, G.: Glandular Abscess (Adenophlegmon) of the Pulmonary Hilum.** *Med. Press*, 1920, n. s. cx, 88.

Glandular abscess of the pulmonary hilum begins as a lesion affecting the afferent lymphatics, a pulmonary or pleural focus of infection which usually contains pneumococci. The examination of the glands of the hilum of patients who have died of the pulmonary form of influenza invariably shows that these glands have undergone enlargement and not infrequently are filled with pus.

In the initial stages the symptoms, which consist of dyspnoea, a dry convulsive cough, and pain in chest, are usually vague. The pain is often localized in the infrascapular fossa toward the inferior angle of the scapula. If the abscess is posterior, percussion may reveal a little partial dullness in the omovertebral space between the fifth and eighth ribs. Vocal resonance is not perceptibly modified. On auscultation the signs predominate in the infrascapular fossa and the corresponding omovertebral space. A distant bronchial souffle due to pressure on the bronchus may be heard. At the base subcrepitant râles are noted almost invariably. These are probably caused by blood stasis following compression of the pulmonary veins. Another very constant symptom is bronchophony in the omovertebral space below the fifth rib with normal resonance above and below this area.

The course of the condition is necessarily associated with considerable constitutional disturbance, wide variations in temperature, and polynucleosis. All of these symptoms remain rather vague until the abscess ruptures spontaneously into the bronchus, at which time the diagnosis is made plain. The rupture is ushered in by aggravation of the symptoms, fever, dyspnoea, etc., and after a violent attack of coughing or dyspnoea the patient evacuates by mouth a quantity of pus which is usually offensive and mixed with blood. Such an evacuation, which is followed by distinct signs of improvement, may be repeated several times. Subsequently auscultation

reveals a well-defined cavity. Recovery follows in the course of a few weeks.

Radioscopy is important in establishing the diagnosis. The condition must be differentiated from mediastinitis, tracheobronchial adenitis, total purulent pleurisy, bronchiectasis, suppurating interlobitis, and encysted pleurisy of the hilum.

Cases of adenophlegmon of the hilum tend to become cured spontaneously following evacuation of the purulent material through the bronchi. Surgery does not appear to help a great deal and may spread the infection. When the abscess is large, however, it may be advisable to induce artificial pneumothorax. In the author's cases instillations of gomenolized oil into the trachea were given. IRVIN W. BACH.

### PHARYNX AND ŒSOPHAGUS

**Thomas, C. C.: The Roentgen Examination of the Œsophagus.** *J. Am. Inst. Homœop.*, 1920, xiii, 107.

The author gives a brief description of the anatomical and physiological peculiarities of the Œsophagus as revealed by the roentgen ray. In making the examination he uses the buttermilk-barium meal when there is considerable stenosis, but otherwise a mixture of barium and acacia. Pieces of bread soaked in buttermilk-barium are of aid in the study of small obstructions. In some instances a string of small lead beads fastened on a silk thread at intervals of about  $\frac{1}{4}$  in. is of very great aid, especially in showing the relation of a diverticulum to the Œsophagus.

Before examining the Œsophagus Thomas thoroughly examines the chest in order to rule out pathologic conditions of the lungs, heart, and other mediastinal structures which might show findings simulating disease in the Œsophagus. The study of the Œsophagus should be followed by a roentgen examination of the stomach inasmuch as gastric pathology may have an etiological relationship to the Œsophageal findings.

The principal intrinsic causes of changes in outline are diverticula, neoplasms, benign strictures, cardiospasm, and inflammatory conditions. Reflex spasms or the presence of particles of food are other factors which must be taken into consideration in the diagnosis. The former may be obviated in part by the administration of belladonna or atropin. The roentgenographic characteristics of typical cardiospasm are conical obstruction at or near the cardia and secondary dilatation of the Œsophagus above. The outline of the carcinomatous Œsophagus is usually irregular and the dilatation is not great. Diverticula, which are usually of the pulsion variety and found at the upper end of the Œsophagus, present a smooth-walled sac.

Thomas gives the case histories of patients with a diverticulum, carcinoma, and cardiospasm. In one of the cases of cardiospasm the condition was assumed to be due to syphilis of the stomach, and in the other, to carcinoma of the stomach.

ADOLPH HARTUNG.



## MISCELLANEOUS

**Foot, N. C.: Report on a Case of Malignant Thymoma with Necropsy.** *Am. J. Dis. Child.*, 1920, xx, 1.

The author reports a case of malignant thymoma in a 9-year-old child, giving the history, the physical findings, and a very complete report of the postmortem and microscopic examination. The outstanding complaint was dyspnoea. The symptoms developed less than two months prior to autopsy. The laboratory findings during life were negative. The X-ray showed a mediastinal mass anterior to the large vessels. The patient died while being anesthetized for the drainage of a possible mediastinal abscess.

At autopsy a huge mediastinal mass was found occupying the anterior mediastinum and the mediastinal structures. The tumor was composed chiefly of small cells resembling microlymphocytes but having vesicular nuclei and acidophile cytoplasm and tending very slightly to anastomose with one another by means of slender processes.

A very careful review of the literature is given. Few cases have been reported. Rubashow collected 75 cases up to 1911 and the author has found the records of less than a dozen since then. Of Rubashow's group of tumors 52 were described as sarcoma, 12 as carcinoma, and the rest variously.

These tumors are epithelial in origin and it is probable that they originate in the thymus.

RALPH B. BETTMAN.

## SURGERY OF THE ABDOMEN

## ABDOMINAL WALL AND PERITONEUM

**Earl, G.: A Modified Inguinal Hernia Technique.** *Minnesota Med.*, 1920, iii, 342.

In operations for hernia, as in perineal operations, muscle tissue approximation is essential. Fascia also must be carefully brought together.

In the author's opinion the best method of obtaining this support is to place the entire external oblique muscle underneath the cord. By this procedure the lowest and weakest portion of the inguinal canal, i.e., the triangle bounded by Poupart's ligament, the pubic bone, and the musculature of the rectus and internal oblique, is entirely closed.

Torek's technique of separating the vessels and sac and keeping them apart is the best method of handling the internal ring.

In the author's method the cord is placed completely over the external oblique and covered only by the superficial fascia and skin. It is then less apt to become strangulated.

Earl has performed the operation described in 42 cases over a period of two years. While this period may be too short to warrant definite conclusions as to the end-results, none of 38 patients who have reported back has had a recurrence or complained of pain from the decreased covering.

MARCUS H. HOEART.

**Denzer, B.: A New Method of Diagnosis of Peritonitis in Infancy and Childhood; Preliminary Report.** *Am. J. Dis. Child.*, 1920, xx, 113.

Denzer describes a technique for obtaining peritoneal fluid for diagnostic purposes. He emphasizes the disadvantages of aspiration and states that because of its many drawbacks the method has fallen into disuse.

The procedure finally adopted by the author was suggested by the classical Pfeiffer experiment in which a capillary tube was inserted into the peritoneal cavity of a guinea pig and fluid obtained by capillary attraction. The needles used were glass

needles prepared from glass tubing  $\frac{1}{8}$  in. thick, with a bore of about  $\frac{1}{32}$  in., which was drawn to a point and beveled. In order to add siphonage to the force of capillary attraction and thereby obtain a larger amount of fluid, a bulb was blown and the tubing was bent.

The procedure is as follows:

The skin of the abdomen is swabbed with iodine and the usual precautions are taken to determine whether the bladder is distended. The skin is then punctured in the midline about  $\frac{1}{2}$  in. below the umbilicus with a No. 17 gage steel needle. The glass needle is inserted through this opening and then, held almost perpendicular to the surface of the skin, is firmly pushed inward until the sudden release of pressure indicates that it has entered the peritoneal cavity. By making the pressure parallel to the long axis of the needle the chance of breaking the needle is decreased.

In a small series of normal children, or rather, children not suffering from peritoneal exudation, fluid was obtained in only one case. In two cases of ascites puncture demonstrated the presence of fluid before a clinical diagnosis of excessive fluid could be established. In one case 0.5 ccm. was withdrawn. In the only case of peritonitis in which the author had the opportunity to try this procedure, purulent fluid was obtained. The amount was ample for culture; smears showed great numbers of gram-positive cocci in chains.

In the author's opinion this experience, brief as it is, establishes abdominal puncture with a capillary tube as a possible method for the diagnosis of intra-abdominal exudates.

Glass needles have distinct advantages. The capillary attraction of glass is far greater than that of metal, and the smallest amount of fluid rising in the tube can readily be seen. Their one disadvantage is their fragility. The author is at present experimenting with needles and trocars of metal and glass in the hope of combining the advantages of both materials.

A. R. HOLLENDER.



## GASTRO-INTESTINAL TRACT

**Bircher, E.: Resection of Branches of the Vagus Nerve in the Treatment of Gastric Affections** (Die Resektion von Aesten des N. Vagus zur Behandlung gastrischer Affektionen). *Schweiz. med. Wchnschr.*, 1920, i, 519.

According to the investigations of Eppinger, Hess, Bergmann, and Westphal, the nervous element in the etiology of gastric ulcer is of great importance. This has been proved by numerous cases in which the classic symptoms of ulcer are presented but an ulcer is not found at operation. It has been demonstrated also by cases in which the development of the ulcer was preceded for some time by gastro-nervous symptoms.

On the basis of experiments and clinical observations the author has come to the conclusion that all cases in which the operative findings do not agree with the clinical phenomena the condition is due to increased tonicity of the vagus nerve. He therefore attempts to lower the excitability of this nerve by resecting the anterior and posterior branches supplying the stomach. Three or four branches of this nerve run along the anterior wall of the stomach at the upper border of the lesser curvature. Bircher isolates and tears them out or double ligates the entire neurovascular plexus at the lesser curvature and then severs it, excising a small portion.

To remove the nerve fibers from the posterior surface of the stomach it is necessary to go through the great omentum between the stomach and the colon.

In the beginning the author chose for the treatment described only cases in which ulcer was not found at operation. Later he applied it also to cases of so-called "gastric neurosis."

The operation is followed by the cessation of the pain, nausea, and vomiting, improvement in the secretory condition, and the return of the normal gastric tone, shape, and position. In Bircher's opinion it will influence the hyperacidity and hypersecretion in ulcer cases as well as a gastro-enterostomy, and the spastic condition better than a gastro-enterostomy. It is indicated especially for cases in which the ulcer syndrome is presented but an ulcer is not found at operation. Callous ulcers are treated best by resection of the stomach.

CARL (Z).

**Rosenthal, E.: The Symptoms and Treatment of Gastric and Duodenal Ulcer** (Ueber die Symptomatologie und Therapie der Magen- und Duodenalgeschwüre). Berlin: S. Karger, 1920.

The author reports his study of 326 cases of ulcer seen during three and one-half years among 3,500 cases of gastric conditions (9.3 per cent). The findings of this study are reviewed thoroughly and recorded in 28 tables. Nine plates and numerous X-ray pictures illustrate the clinical findings and the results of treatment.

The author's conclusions regarding the treatment, which are at variance with generally accepted theories, are as follows:

1. The great majority of cases may be cured by appropriate internal therapy or so much improved that the patients are able to perform their daily duties. Ulcers therefore should be treated medically as cases operated upon remain cured only if a dietary regime is followed faithfully after operation as well as before. This statement does not apply, however, to cases of ulcer in which an organic stenosis has been formed.

2. Hyperacidity and hypersecretion, the principal factors favoring ulcer, are treated more effectually by internal therapy than by gastro-enterostomy. Medical treatment is indicated also for penetrating and calloused ulcers of the lesser curvature as the surgical procedure is associated with a relatively high mortality and does not prevent recurrence. A cure or improvement obtained by medical means is usually associated with the partial or complete disappearance of the ulcer or ulcer folds.

While this monograph deals with gastric and duodenal ulcer purely from the medical standpoint it is of interest also to the surgeon. KOLMESS (Z).

**Duval, P.: New Points in the Treatment of Ulcer of the Lesser Curvature** (Neue Hinweise fuer die Behandlung des Geschwuers der kleinen Kurvatur). *Plus-Ultra*, 1920, iii, 5.

Ulcers of the lesser curvature merit special attention, next to ulcers of the pylorus, because of their frequency, their special clinical symptoms, their complications (hæmorrhage, subphrenic abscess), and their characteristics in the roentgen picture. They require also special surgical treatment. Operation must be directed not only against the local development of the ulcer, but also against spasm and hypersecretion. Surgical procedures are of two kinds, direct (excision and resection) and indirect (gastro-enterostomy).

Gastro-enterostomy, while an indirect method, affects the spasm and hypersecretion directly by emptying the stomach. The direct methods are (1) Balfour's operation, the destruction of the ulcer by cauterization from without inward; (2) a wedge-shaped excision, the removal of a large portion of the stomach, or transverse resection; and (3) Roth's method in which the stomach above the pylorus is folded off in two directions to wall off the ulcer and a gastro-enterostomy is performed.

Cauterization and excision have no effect upon the spasm and hypersecretion. Transverse resection cuts through a large number of nerve fibers on the lesser curvature and renders the pylorus functionless. To date, gastro-enterostomy has been regarded as the procedure of choice. The mortality is slight, from 1 to 3 per cent, and in cases of ulcer of the pylorus a cure is obtained in from 89 to 90 per cent. In ulcer of the lesser curvature, however, a cure is obtained in only from 30 to 31 per cent. Many ulcers are not benefited at all, even becoming



worse. In such instances hæmorrhage may reappear and subphrenic abscesses and cancerous degeneration may develop.

Of the direct methods Balfour's procedure has a mortality of 1 per cent and results in a cure in 85 per cent of the cases and improvement in 12 per cent. In 2 per cent it is without effect. Saddle excision has a high mortality varying from 10 to 11 per cent. This operation is more difficult and does not overcome the spasms. Transverse resection has a high mortality of 12.5 per cent in Germany although in America the improbable percentage of 2.5 is reported.

The roentgen-ray examination shows that after excision the stomach is spiral shaped but functions painlessly. The transverse excision leaves an hour-glass stomach but gives very good functional and clinical results.

The choice of operation depends upon the stage of the condition. In the first stage, when only a small "star" can be seen in the mucosa, the author regards thermocauterization as the only logical procedure. It has the disadvantage, however, that it does not cure the spasms and therefore must be followed by a gastro-enterostomy. This combination gives the best results in every way. In the second stage of callous or penetrating ulcer the saddle-formed excision by transverse resection is to be considered. In the third stage, the stage in which the ulcer is very extensive, the direct complications may be prevented by a gastro-enterostomy. The best solution of the problem is to operate in two stages, performing first a gastro-enterostomy and then a resection several months later when the patient's condition allows it. HELLER (Z).

**Bing, H. I.: Polycythæmia in Ulcer Near the Pylorus** (Polyglobulie dei Ulcus juxta-pyloricus). *Ugesk. f. Læger.*, 1920, lxxxii, 337.

Friedman was one of the first to call attention to the presence of polycythæmia in cases of gastric ulcer. The author investigated this finding and discovered an increased number of red cells in the first case he examined. Friedman's explanation that the increase of adrenalin in the blood is correlated with ulcer and polycythæmia is discarded by Bing as "too ingenious."

Bing holds that as a result of retention and vomiting the water content of the blood is decreased and the erythrocytes are increased relatively. In a case of gastric ulcer in which improvement followed regulation of the diet it was found also that the red cell count had been considerably decreased. Further investigation demonstrated the fact that in spite of the high red cell count the nitrogen of the serum remained normal. Moreover, the quantity of urine excreted was increased relatively so that dehydration was out of the question. In Bing's opinion it seems probable that the body undergoes a loss of salts as the result of a decrease in the chlorides, and that the decrease in the water content is due to this change. The latter is necessary

if the normal concentration of the blood is to be maintained.

The chlorides contained in the stomach are not inconsiderable in amount. In the blood the chlorides are distributed in different proportions in the plasma and the corpuscles. An increase in the carbon dioxide is associated with an increase in the chlorides in the blood. Moreover, as it has been established that the plasma contains more sodium chloride than the corpuscles, it follows that the blood contains much sodium chloride in polycythæmia and little in anæmia.

To calculate the normal chlorides the following formula is of value:  $b = 29.50 c$ . In this formula  $b$  represents the number of blood corpuscles, and  $c$ , the chlorides.

SAXINGER (Z).

**Hey, R.: Pneumatosis Cystoides Intestini Hominis** (Ueber pneumatosis cystoides intestini hominis). *Deutsche Ztschr. f. Chir.*, 1920, cliv, 250.

Pneumatosis cystoides is characterized by the formation of multiple air cysts in the intestinal wall and occasionally also in other parts of the body. The condition may occur at any age except extreme youth, but is most common in middle-aged males.

Including the author's case, 66 cases have been reported. In 10 instances pneumatosis cystoides was the only condition found. In the other cases conditions such as pyloric stenosis secondary to ulcer or carcinoma (66.5 per cent), peritoneal or pulmonary tuberculosis, myocardial insufficiency, appendicitis, and ileus co-existed. The usual site of the disease is in the wall of the lower part of the ileum. The large intestine, the stomach, the peritoneum, the mesentery, and the omentum also have been found involved.

As a rule the condition is localized to one small area of the intestine. Von Hahn and Demmer, however, have reported a case in which both the large and small intestines were attacked. The size of the individual cysts varies from that of a pin to that of a walnut. In 1 case a single cyst the size of a fist was discovered. The walls of the cysts are translucent. On microscopic examination multiple round or oval air spaces are found in the subserosa or submucosa. The cyst walls are formed by connective tissue lined with epithelium. Occasionally giant cells are present. Signs of inflammatory reaction are usually absent. The cysts contain a mixture of oxygen and nitrogen gas. In 3 cases carbon dioxide, and in 1 case hydrogen, was found.

In regard to the etiology two theories have been advanced, one attributing the condition to infection and one tracing it to mechanical causes. Some of the authors reporting cases have found short rods which they claim are the responsible agents. The theory attributing the cyst formation to mechanical factors is based on the fact that often in lesions of the intestinal wall, such as those of tuberculosis, and primary appendicitis, small defects in the mucosa are formed. It is possible also that an atrophic change and hypersensibility of the in-



testinal wall may play a part. Such conditions might cause very minute tears in the mucosa through which, by a sudden increase in the intra-intestinal gas pressure, gas and bacteria might be forced into the intestinal wall.

Pneumatosis cystoides is seldom diagnosed during life as there are no characteristic symptoms. The cysts are usually discovered during operation for some other pathologic condition or at autopsy. In several cases they have been the cause of intestinal stenosis. In 1 instance complete stenosis was followed by perforation and peritonitis. In another, death followed intussusception. Von Hacker reports a case in which a soft crepitation was present which should have led to the diagnosis.

In most instances the treatment has been directed toward the primary ailment. Some surgeons have left the cysts entirely alone, while others have punctured them. In cases in which the cysts were not opened and a second operation was necessary for some other condition it was found that the cysts had entirely disappeared, leaving behind only small scars on the serosa. Therefore it may be concluded that the only indication for intestinal resection is marked stenosis. The prognosis is favorable. Death due to pneumatosis cystoides occurred in only 3 cases.

A case reported by the author was that of a man 41 years of age who came to operation because of stenosis of the pylorus following ulcer. In this case two cysts were found in the lower part of the small intestine, one the size of a hen's egg and the other that of a man's fist. Both were composed of many small cysts. Between these two cysts were numerous smaller isolated cysts. Forty-five centimeters of the lower part of the ileum were resected. The stenosis was treated by posterior gastro-enterostomy. The patient recovered. NEUPERT (Z).

**Summers, J. E.: Acute Intestinal Obstruction, the Cause of High Mortality; How This May Be Reduced.** *Ann. Surg.*, 1920, lxxii, 201.

The chief cause of the continued high mortality in acute intestinal obstruction is the tardy clinical recognition of the condition and the resultant too-late operation. The fatal delay is often due to inability to differentiate between the symptoms of intestinal obstruction and those of acute abdominal perforations and infections. Ill-advised treatment by purgation or repeated doses of morphine also are responsible for many unnecessary deaths.

Acute intestinal obstruction should be suspected when a history of sudden abdominal pain soon followed by vomiting is given and there has been complete absence of the passage of fecal matter and gas from the anus following several compound enemas. Under such circumstances an operation is the only rational procedure unless the history and physical findings indicate that these symptoms are not leading. If the diagnosis is made, the obstruction is relieved within the first twenty-four hours, and the gut is viable, the patient usually recovers. On the other

hand, if fecal vomiting occurs, the abdomen is distended, the respiration feeble, the pulse small and rapid, and the temperature elevated, an operation is almost useless and tends only to bring surgery into disrepute.

Faecal vomiting indicates that the intestinal current is reversed. Therefore when the patient's general condition permits, drainage should be effected high up in the jejunum, as near its origin as possible, by means of a No. 20 or 22 French catheter fastened in with a purse-string suture. The obstructed intestine may be regarded as possessing three distinct zones, the lower zone being more or less collapsed, the central zone containing chiefly gas, and the upper zone containing fluid. As Bonney says: "The drainage opening must tap the fluid-containing segment." Drainage of the jejunum overcomes the vomiting.

When there is gangrene of an annular type resection should not be done but the gangrenous area should be invaginated as an intussusceptum and the gut properly sutured so as to form an intussusceptum. The gangrenous area will later slough away and the continuity of the canal will be re-established. Resection is advisable only when the patient's condition permits it; otherwise resort should be had to a temporary life-saving measure such as the formation of an artificial anus or an anastomosis to side-track the obstruction.

The scientific principles upon which Crile bases his operative and postoperative treatment in general surgery are of particular importance in grave cases of abdominal surgery and especially in the treatment of acute intestinal obstruction.

In conclusion the author states that in his opinion the high mortality of acute intestinal obstruction would be reduced from 25 to 50 per cent if surgeons would bear in mind the following precepts: Operate early; do only what is essential; do it rapidly and well; establish proper drainage; and perform the shockless operation through anoci-association.

**Brewitt, R.: Obstruction of the Bowel Due to Pelvic Exudates Following Gynecological Operations and Its Treatment** (Darmabschluss durch Beckenexsudat nach gynäkologischen Operationen und seine Behandlung). *Zentralbl. f. Gynaek.*, 1920, xlv, 627.

Following various operations on the female genital organs heavy pelvic exudates are formed. These may entirely fill the true pelvis, and as they have no tendency to become softened, they press upon the intestine and interfere greatly with the movements of the bowel. Every movement of intestinal contents or intestinal gas further irritates the inflamed tissues and increases the inflammation and exudation. This explains why all conservative therapeutic measures, such as baths, enemas, etc., are of no benefit. The thick exudate hinders the flow of blood and lymph, and intestinal stasis results with tumefaction of the mucosa especially where the intestine enters the inflamed area. The clinical



picture is therefore that of a chronic ileus which appears at first to be benefited by enemas, etc., but in reality becomes progressively worse and leads to complete intestinal obstruction.

In most cases there is a fever varying from 38 to 38 degrees C. On rectal examination the true pelvis is found to be filled with hard, unyielding exudate and with the palpating finger the intestinal opening is felt to disappear in the mass like a tunnel. The abdomen is inflated and sensitive.

Treatment must be directed to overcoming the intestinal obstruction. This must be done by as conservative measures as possible as usually the patient is in very poor condition. Under local anaesthesia the author makes an incision in the abdominal wall, separates the abdominal muscles bluntly in the direction of the fibers, and sutures a portion of the descending colon to the peritoneum. He then places a layer of iodoform gauze over the peritoneal edge and punctures the intestine so that the gas may escape. On the following day he makes a transverse incision 1 cm. in length. After two or three days the intestinal wall in the area of exudate decreases in thickness and the intestine is again permeable. Because of the absence of peristalsis the conservative therapeutic measures which formerly were without effect are now of great benefit. After ten or twelve days the serious clinical picture has disappeared and the intestinal fistula, which is no longer necessary, may be allowed to close quickly.

The author gives the histories of 4 cases of the condition described which illustrate the favorable results obtained from the treatment advocated.

SIMON (Z).

**Wood, W. Q.: Resection of the Colon by the Three-Stage Method.** *Edinburgh M. J.*, 1920, n.s. xxv, 106.

Resection of the large intestine followed by immediate anastomosis is an operation the mortality of which is considerable, even when it is undertaken under the most favorable conditions. The semi-solid contents of the colon are apt to become arrested at the site of the union where they exert injurious pressure on the sutures with resulting ulceration and cutting out of the stitches. When obstruction has been present in the large intestine previous to the operation, this course of events is almost certain. The walls of the intestine above the obstruction are thick, congested, and sodden, and sutures will almost invariably cut out of such unhealthy tissue.

In deciding on the operative treatment in cases of acute obstruction of the large intestine a choice may be made from three procedures:

1. The operation may be limited in the first instance to the relief of the obstruction by colostomy, cæcostomy, or even appendicostomy, and a second laparotomy performed later to remove the cause, as a rule a malignant tumor.

2. In a few cases, when the obstruction is of minor degree, an anastomosis may be performed between

the ileum and the colon below the tumor, the underlying cause being dealt with later.

3. A two-stage or a three-stage operation after the method of Paul and Mikulicz may be carried out.

The technique of the three-stage operation is as follows:

The first stage consists in bringing the loop of the bowel containing the tumor or other pathologic condition well outside the abdomen, fixing it there, and if possible suturing the two limbs of the base of the loop together. A Paul's tube with colostomy tubing attached is then tied in above the tumor to overcome the obstruction. The second stage, which is carried out about a week later, consists in the removal of the loop of bowel with the attached mesentery, at the base of the loop, almost flush with the abdominal wall. A Paul's tube is then tied into each divided end of the intestine to prevent hæmorrhage from the cut surfaces. The third stage of the operation consists in closing the fæcal fistula. This is facilitated in the first instance by the application of the enterotome of von Mikulicz to the spur or septum between the two ends of the bowel.

In acute obstruction of the large intestine colectomy by the three-stage method is often the wisest procedure and may be quite satisfactory in its ultimate results even though the patient's condition is serious by reason of toxic absorption. Also when, in the absence of acute obstruction, a patient who is suffering from a carcinoma of the colon is feeble and in poor condition to withstand the strain of a severe operation, this method has much to recommend it as it is followed by practically no post-operative shock.

HOWARD A. MCKNIGHT.

**Axtell, W. H.: Appendicitis, Hernia, and Anorectal Diseases of the Young Soldier.** *Am. J. Surg.*, 1920, xxxiv, 215.

The author states that an astonishing number of physically and mentally defective youths were accepted for army service who should have been rejected. Having been accepted, they almost immediately became expensive wards of the government and many of them will remain wards of the government for the rest of their lives. In Axtell's opinion the defects in these cases may be traced back to birth and their persistence was due to the fact that no systematic program had been carried out for the child's physical development. The prevalence of such defects became more evident when the men were segregated at mobilization camps in great numbers.

Axtell found also an astonishing number of intestinal and anorectal diseases such as were hardly to be expected in young men. Men with these conditions and those who were poorly nourished or poorly developed early became victims of military training. The failure of reparative measures may be attributed to the non-resisting and non-vigorous tissue due to the lack of physical training so essential to vigorous manhood.



In 70 cases of intestinal and anorectal diseases reported, hernia and recurrent hernia took first place with 17.5 per cent of operative failures. Hæmorrhoids came second; appendicitis, third; fistula-in-ano, fourth; fissure-in-ano, fifth; and prolapsus recti, sixth. According to the provisions of the War Risk Insurance Act, the disabilities in these 70 cases entail a fixed expenditure of \$439,200 exclusive of the cost of subsequent treatment, hospital care, appliances, and increased compensation for increase of the disabilities, a sum which in most cases exceeds the amount of actual compensation.

The primary cause of the deficiencies described dated back to birth; in other words, the child's health was made secondary to material success although for the past twenty-five years various agencies, such as the U. S. Public Health Service for Child Welfare, the Anti-Tuberculosis Association, and others have carried on a vigorous campaign of education. The cause of the development of these conditions and of failure in attempts to correct the deficiencies is attributed, first, to the military necessity requiring early return to duty, and second, to the lack of skill on the part of those in charge of the after-care of such patients, the wearing of ill-fitting uniforms, and the improper use of the various army belts, etc.

In conclusion the author expresses the opinion that if the principles of military training and the instruction in personal hygiene, sanitation, regulation of habits, and other subjects given during the war were followed in civil life, they would be the means of creating at least two generations of vigorous manhood and that in the future the public in general, observing the tremendous benefits, would be more easily approached in regard to the physical care and development of the child.

**White, F. W.:** A Brief Experience with Appendicostomy and Cæcostomy for Intestinal Stasis in Epilepsy and Neurasthenia. *Am. J. M. Sc.*, 1920, clx, 199.

In a review of the literature not one considerable series of cases was found in which uniform benefit was derived from appendicostomy and cæcostomy in epilepsy and neurasthenia.

The author reports 4 cases, 2 of epilepsy and 2 of neurasthenia, which were operated on as a last resort by this method. In both of the cases of epilepsy the condition was of fourteen years' duration. The neurasthenic patients complained of headache, insomnia, attacks of indigestion, anorexia, loss of weight, poor circulation, fatigue, and mental apathy. In all of these cases there had been habitual constipation, the cæcum was palpable, and a delay in the passage of barium was shown in the roentgen examination.

One of the neurasthenic patients was given irrigations twice a day for a while and than once a day for ten days. As considerable discomfort then developed near the opening in the intestine, the ap-

pendix was removed and the abdomen closed. During the period of treatment the patient gained 15 lb. in weight.

The second neurasthenic patient also was given daily irrigations. In this case the appendicostomy incision still remained open at the end of nineteen months.

Following treatment by daily irrigation in the first case of epilepsy the attacks stopped for eight months but the appendicostomy opening was not allowed to close for twenty-seven months.

In the second case of epilepsy daily irrigation was given for six months. The attacks stopped for two months and the patient gained 5 lb. in weight. The appendicostomy opening was allowed to close after six months.

The condition of one neurasthenic patient is today definitely improved but that of the other is unimproved. In the cases of epilepsy the results were striking for a time but the attacks recurred in a milder form.

In the selection of cases for this form of treatment an attempt must be made to determine whether the condition is the cause or the effect of intestinal stasis.

Thorough medical treatment must be given before operation is considered. The greater the delay in the emptying of the colon the more suitable the case for surgery. Short-circuiting and colectomy are too severe for trial.

KARL L. VEHE.

**Chase, I. C.:** The Surgical Principles Involved in the Treatment of Rectal Fistulæ. *Texas State J. M.*, 1920, xvi, 154.

According to Chase, a cure is claimed in less than 50 per cent of the cases of rectal fistulæ on record. The poor results are due largely to the lack of correct surgical principles. The author outlines five essential fundamental principles, but directs attention chiefly to the third, viz:

"The advancement of the rectal mucosa sufficiently to provide a perfect rectal and anal canal with no solution of continuity through which infection may pass to the perineum, peri-anal, and ischio-rectal spaces.

"For a complete, deep fistula, the old method of incising the intervening tissues on a grooved director may be followed. The wound is retracted and gives easy access for dissection. The fistulous tract is excised or curetted, as thought best. The mucosa is then seized with broad-nosed forceps. With the handle of the knife, or best, by blunt-pointed scissors curved on the flat, aided when necessary by a snip, the mucous tube, or the accessible part of it, is dissected from the muscularis until a sufficient flap or tube of mucosa may be pulled out by gentle traction.

"Next, in a fistula of this type, the cut muscularis and the internal sphincter are united. In certain cases the sphincters need not be cut, but after the dissection of the mucosa the fistulous tract may be dissected through the sphincter, should it penetrate



it, or if wide drainage be indicated, the sphincters need be only loosely approximated, in which case the perfect mucous tube will keep the mucosa from overlapping or growing between the sphincter ends, which is one of the frequent causes of failure of sphincter repair.

"Next, the external sphincter and the inner portion of the perineum may be united. Non-absorbable tension sutures should be used externally. The outer part of the perineal incision, the original site of the sinus, should be left open to a degree indicated by drainage requirements. Next, the mucous tube is pulled down, folded in order to get a good bite with the needle, and sutured to the skin. There should be little tension on this mucosa; it should be united to the skin by as few stitches as are required to hold it, in order that good drainage may be afforded the submucous space.

"This mere technique discloses and drains some blind submucous fistulous extensions which are overlooked and undrained by present methods of operating. Redundancy of the mucous membrane will rapidly disappear or, if desired, it may be trimmed off when union is complete in its new position in the anal canal. The object of the whole procedure is thus seen to be the transformation of the original pathology into a blind, external fistula."

This detailed procedure is clearly illustrated with drawings and photographs. The author gives a short history of the method and mentions the slight modifications which have been suggested by other workers.

A. R. HOLLENDER.

#### LIVER, GALL-BLADDER, PANCREAS, AND SPLEEN

**Rous, P., and Larimore, L. D.: The Biliary Factor in Liver Lesions.** *J. Exper. M.*, 1920, xxxii, 249.

The term "biliary" has long been applied to a diverse group of hepatic lesions distinguished by a peculiar cirrhosis with more or less evidence of stasis in the finer bile ducts and inflammation of their walls. The actual part played by bile in the production of the connective-tissue changes seen in such cases and of chronic lesions in the human liver in general is not definitely known. According to some authors human bile is incapable of permanently injuring the liver, but there is positive evidence that in some cases it has been the cause of severe hepatic damage.

For the purposes of the investigation here reported the authors assumed that human bile, while innocuous as compared with the bile of certain other species, sometimes produces liver injury. Their object was to obtain through experiment a better understanding of "biliary lesions" with special reference to the part played by bile in their causation. No attempt was made to ignore the factor of infection.

Rabbits were used in the experiments as in this animal it is possible to obtain results uncomplicated by infection or intercurrent cirrhosis.

Ligation of the common duct of the rabbit resulted in a mixed lesion from injury throughout the entire length of the bile channels. When single ducts were obstructed and the portal stream altered, cirrhotoses of pure monolobular and diffusely intralobular types were produced. The character of the connective-tissue changes was determined by the path of escape of the bile from the collecting system. This was conditional to a great extent upon the secretory activity, which in turn was dependent upon the blood flow. The portal flow was largely diverted from regions of local stasis through encroachment on the stream bed by the dilated ducts.

It was found that there was a large margin of safety in bile elimination by the normal hepatic tissue. Less than a quarter of the liver of the rabbit—and this deprived of its entire portal stream—sufficed to keep the organism healthy and free from clinical jaundice when the ducts of the remainder of the liver, which received all of the portal blood, were ligated. The vicarious elimination thus illustrated was of great importance for regions of local stasis as it kept the blood relatively free from bile, thus preventing resecretion into such regions and facilitating exchange from them into the body fluids.

The experimental monolobular and intralobular cirrhotoses were the result of the limitation of biliary lesions to special levels of the duct system. Their resemblance to the various forms of "biliary" cirrhosis referred to as "Hanot's cirrhosis" was close, and in the authors' opinion the diverse liver lesions of Hanot's disease may be readily explained by the assumption that the stasis, with or without infection, which was indubitably present, had its situation at different levels in different cases. There were reasons for the view that bile stasis *per se* was sometimes a prime cause of the malady. Certainly such stasis complicated many chronic liver lesions.

GEORGE E. BEILBY.

**Finsterer, H.: The Diagnosis and Treatment of Liver Injuries** (Zur Diagnose und Therapie der Leberverletzungen). *Beitr. z. klin. Chir.*, 1920, cxix, 598.

Finsterer reports 15 cases of liver injuries, 12 of them subcutaneous ruptures and 3 gunshot wounds. In 12 of them there was a slowing of the pulse which the author regards as a definite and constant symptom of liver injuries. To demonstrate it the determination of the pulse rate must be begun soon after the injury and continued for some time because finally, as the anemia increases, a quickening of the pulse sets in. In 3 of the author's cases, which were not observed sufficiently because they entered the hospital late, no bradycardia was noticed.

Finsterer attributes the bradycardia to the bile acids and has proved the truth of this assumption experimentally. The demonstration of a bradycardia indicating an injury to the liver is not necessarily an indication for operation, however, as this symptom occurs also in the so-called subcapsular rup-



tures which often become cured without operation. The presence of other symptoms of hæmorrhage, such as anæmia and ascites, are essential to warrant surgical measures. When they are present the slow pulse should not be regarded as contra-indicating operation. In such cases the persistence of the bradycardia after continued hæmorrhage is a favorable symptom provided immediate operation is undertaken.

Regarding treatment the author points out that in many cases packing is sufficient to stop the bleeding. Operation should be performed under local anæsthesia, a little ether being given while the liver is being handled. Chloroform is contra-indicated lest degeneration of the liver parenchyma follow, especially in the presence of anæmia. Blood transfusion is to be considered, even though Kreuter's cases are not enlightening in this matter.

AGEMANN (Z).

**Zerbino, V.: The Relation between the Hydatid Cysts of Children and Those of Adults** (Relaciones entre el quiste hidático del niño y el del adulto). *An. Fac. de med. Univ. de Montevideo*, 1920, V, 46.

Hydatid cysts are pre-eminently a disease of infancy, childhood, and early adult life up to about the age of 35 years. Early life up to the age of puberty constitutes the period in which they are most common. The frequency of cases within this period includes at least one-third of all cases. The period of greatest frequency is between 20 and 25 years.

Hydatid infection may occur at any age but depends largely upon close contact with the soil, which is more favorable in childhood.

The development of hydatid cysts seems to take place very easily and rapidly in infancy, the cysts becoming manifest in their most common locations in from one to six years. Multiplicity of hydatid infection in the same child is frequent, a fact to be explained upon the basis of frequent exposure and contamination.

Vesiculization and suppuration of hydatid cysts are less frequent complications in children than in adults. They may occur, however, at almost any age and in almost any stage of evolution of the cyst according to the particular organ involved. The cyst may reach a very large size in a relatively short time.

Neither vesiculization, suppuration, nor the size of the cyst is a criterion of the age of the cyst. Its development and senescence depend upon the growing conditions of the medium which is furnished the parasite. The author's statistics show that from two to eight years are sufficient for the cyst to be recognized clinically and also to attain considerable size.

The growth of cysts is not equal in all tissues nor uniformly progressive in a given location. They may undergo periods of inhibition and exacerbation.

WILLIAM R. MEEKER.

**Carro, S.: The X-Ray Diagnosis of Gall-Stones** (El diagnóstico radiológico de los calculos hepáticos). *Prog. de la clín.*, Madrid, 1920, viii, 181.

Radiological exploration in cases of cholelithiasis is difficult and in most cases unsuccessful. The difficulties depend upon the subject examined, the constitution and anatomical relations of the liver, and the nature of the calculi. The abdominal viscera are more difficult to examine in obese persons. The distance of the calculi from the plate is also increased in such cases, so that the image of a stone which would otherwise appear indistinctly is unrecognizable. Moreover, the location of the gall-bladder may be inconstant and vary within wide limits from the normal anatomical position of the ninth costal cartilage.

In cases of enlarged liver, ptosis, adhesions in the region of the gall-bladder, and pressure by tumors in neighboring viscera, the location of the gall-bladder is made uncertain. The presence of pathologic conditions in the liver, such as cirrhosis, congestion, etc., and the viscosity of the bile surrounding the calculi are other features which will affect the diffusion of rays and the projection of the image onto the plate. In addition it is well known that stones composed of pure cholesterol are difficult to demonstrate, and the majority of stones are made up for the most part of this substance. Those containing a fair amount of calcium salts are more easily recognized by their nearly circular outline, the comparatively dense border, and the more or less transparent central portion. The composition of the stone is therefore of greater importance than its size.

Before examination the gastro-intestinal tract should be thoroughly emptied. Since the presence of gas in the stomach favors gall-stone shadows, the patient should be given 4 gm. each of sodium bicarbonate and tartaric acid just before the exposures are made. The colon should also be inflated with air just before the examination. The patient should then take a ventral position above the plate with the arms crossed so that the right upper quadrant lies in complete contact with the plate. Two exposures are necessary, one with a soft tube and another with a medium hard tube. The patient should hold his breath in deep inspiration and the exposures should be instantaneous.

In the interpretation of the plate there are many causes for confusion. Calculi of the right kidney, enteroliths, calcified costal cartilages, calcified lymph glands, and pancreatic calculi have all been mistaken for gall-stones. The percentage of successful demonstrations by the X-ray is therefore very low, the general average of all operators being 2 or 3 per cent. The highest claims are between 10 and 15 per cent. In many hundreds of gastro-intestinal examinations the author has never discovered gall-stones incidentally. With the technique described, however, they may be demonstrated in from 5 to 10 per cent of cases.

WILLIAM R. MEEKER.



**Warren, R.: The Treatment of the Diseased Gall-Bladder.** *Practitioner*, 1920, cv, 102.

The gall-bladder should not be removed when the difficulties of its removal are so great as to render the operation dangerous or it can be advantageously employed to drain the biliary passages. Warren regards the diseased gall-bladder very much in the same light as the diseased appendix, and believes that the correct treatment is cholecystectomy performed while the condition is still localized.

In considering the early diagnosis of gall-stones it is most important to remember that such calculi are a very fertile cause of dyspepsia, especially in stout middle-aged women. In such subjects the presence of gall-stones should be suggested by the occurrence, after meals, of pain or discomfort associated with nausea and sometimes with vomiting which does not relieve it, and with flatulence which is often troublesome at night, causing great discomfort in the chest and a feeling of suffocation. The two classical signs, pain, which is sufficiently severe and spasmodic to warrant the term "colic," and jaundice, are often absent for a long period; in fact, the first evidence of severity may be an attack of acute cholecystitis with local peritonitis. The possible presence of gall-stones should be borne in mind, therefore, in the examination of patients who are supposed to be suffering from flatulent or nervous dyspepsia or some obscure form of heart attacks. If reasonable evidence of calculi is found, operation should be advised before the complications ensue which are apt to render surgical treatment more difficult and prolong convalescence.

HOWARD A. MCKNIGHT.

**Krabbel, M.: Torsion of the Neck of the Gall-Bladder** (Die Stieltorsion der Gallenblase). *Deutsche Ztschr. f. Chir.*, 1920, cliv, 1, 76.

The author has observed three cases of torsion of the gall-bladder. These were cases of so-called "wandering gall-bladders," two of which were twisted about 360 degrees, and one, 180 degrees. The condition resulted in marked disturbances of nutrition.

In the literature the author has been able to find the reports of five other cases of this kind. These he gives briefly. According to Payr, the torsion is due to the fact that the veins of the neck of the gall-bladder are stretched by constant pressure of the blood and therefore become long and tortuous. When, because of a pathologic condition, this pressure is increased still further, it causes the organ to twist upon itself. As the veins are unable to untwist this torsion because of their lack of strength the majority of authors believe that other factors are involved in addition. In Krabbel's opinion the cystic duct acts in the same way as the veins when it becomes elongated by pressure.

The condition occurs only in very old persons who are decrepid and emaciated, and most often in women. At first a tumor mass the form and size of a kidney placed transversely may be palpated

at the under margin of the liver. In the later stages the symptoms of ileus and peritonitis predominate. As a result of the torsion hemorrhagic infarction of the gall-bladder occurs, then necrosis, and finally perforation.

The treatment is surgical, namely cholecystectomy. As a rule the operation is not difficult and if performed in time offers a good prognosis.

WINTWARTER (Z).

**Hutchinson, H. S., and Fleming, G. B.: The Digestion and Absorption of Fats in a Case of Congenital Atresia of the Bile Ducts.** *Glasgow M. J.*, 1920, n.s. xii, 65.

The authors report a case of congenital atresia of the bile passages, a not uncommon condition, to demonstrate the effect of the absence of bile from the intestine on the digestion and absorption of fats. The results of the study of fat metabolism, which was made very carefully, are summarized as follows:

1. The digestion of fat was only slightly inhibited, the fat being split into free fatty acids and soaps to almost the same degree as in normal conditions. The daily loss of neutral fat was only 1.87 gm. out of an intake of 19.6 gm.

2. The absorption of fat was very defective inasmuch as in this case it was about one quarter of what it should have been normally.

3. In view of the fact that at postmortem the pancreas was found to be normal and its duct patent, it is logical to conclude that the absence of bile inhibited the lipolytic action of the pancreatic secretion to only a slight extent. On the other hand, the analysis of the stools revealed a gross defect in the absorption of soaps and fatty acids and as the one abnormal factor was the absence of bile from the gut, it is reasonable to suppose that bile is a factor of importance in the absorption of fat rather than in the fat-splitting action of the pancreatic secretion.

HAROLD K. BEGG.

**Speed, K.: Carcinoma of the Pancreas.** *Am. J. M. Sc.*, 1920, clx, 1.

In this article the author discusses the important diagnostic symptoms and the operative methods employed in 52 cases of primary pancreatic carcinoma and tabulates the anatomical diagnoses from 12 autopsies.

The most prominent symptoms in order of frequency were as follows:

1. Cachexia. This was present in 90 per cent of the cases, and was very rapid.

2. Jaundice. Jaundice was found in 80 per cent of the cases, and in many was the condition which first alarmed the patient. It was progressive and soon presented all the symptoms of cholæmia.

3. Pain. This symptom was present in 61 per cent of the cases. At first it was colicky in character and in many cases was noticed just preceding the onset of jaundice. After a few weeks it became duller but remained constant and frequently referred to the back.

4. Knowledge on the part of the patient regarding the presence of an abdominal tumor mass. This was recorded in 55 per cent of the cases.

5. Ascites and hæmorrhage. These occurred in about 20 per cent of the cases.

In the diagnosis the X-ray examination, stomach analysis, and various laboratory tests proved to be of little value.

Surgical treatment is difficult to apply to patients suffering with carcinoma of the pancreas because of the increase in the coagulation time of the blood, the fatal results of free pancreatic secretion in the abdominal cavity, and the slow formation of adhesions in the presence of pancreatic exudate. The author prefers palliative treatment consisting of cholecystenterostomy and drainage of the bile. The condition is rapidly fatal, however, death usually resulting within a few weeks. Speed lays stress upon the importance of examining the pancreas when operating in the region of the pylorus or gall-bladder.

In autopsies following death from carcinoma of the pancreas it was found that:

1. The head of the pancreas was the portion most often involved by the carcinoma, the body next, and the tail least often.

2. Metastasis usually occurred first in glands around the pancreas and the gall-tracts, and next in the liver.

3. The common duct is completely embedded in the head of the pancreas in 62 per cent of human cadavers; in the remainder it lies in a deep groove in the head of the gland.

4. There are two forms of carcinoma of the pancreas, one type the cylinder cell adenocarcinoma, and the other carcinoma simplex.

HAROLD K. BEGG.

### MISCELLANEOUS

**Kaestle, C.: The Healing Effect of Air in the Abdominal Cavity** (Heilwirkung der Luftfüllung der Bauchhöhle). *Muenchen. med. Wchnschr.*, 1920, lxvii, 714.

The author reports three cases the cure of which he ascribes directly to the injection of air into the abdominal cavity. In all of these cases there was severe pain in the epigastrium associated with a decrease in the patient's general strength and nutrition. The liver was greatly enlarged and in 2 cases there was also enlargement of the gall-bladder. An exact diagnosis could not be made. Even the pneumoperitoneum did not clear it up. The air was allowed to remain in the body. Immediately after its injection marked improvement was noted in every instance. This improvement continued, and in five or six weeks recovery had resulted, the pain and the enlargement of the liver and gall-bladder having disappeared entirely. All other therapeutic measures were discontinued. The cause of the recovery is difficult to explain. Especially in the first case it is probable that the pressure change in the abdomen, and perhaps also the breaking up of adhesions, had something to do with the result.

E. KOENIG (Z).

## SURGERY OF THE EXTREMITIES

### DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

**Coley, W. B.: Sarcoma of the Clavicle—Results Following Total Excision.** *Ann. Surg.*, 1920, lxxii, 231.

In a previous paper the author reported a total of 65 cases of sarcoma of the clavicle, nearly all of which had been treated by total or partial resection. In addition to these he has had under his own observation since that time 5 other cases which are herewith reported.

This article contains also a complete table of all the reported cases of sarcoma of the clavicle, totaling 105.

Coley summarizes his conclusions from this study as follows:

1. Malignant tumors of the clavicle are comparatively rare, only 16 cases having occurred in more than 275 cases of sarcoma of the long bones observed personally. The greatest number belonged to the sarcoma group, the few cases of carcinoma being metastatic developments from some recognized or unrecognized primary focus.

2. Sarcoma of the clavicle occurs more frequently in men than in women, probably because the

clavicles of the male are injured more frequently than those of the female.

3. In the great majority of cases sarcoma of the clavicle is associated with recent local trauma, either in the form of a direct blow or muscular strain.

4. A clinical history of pain and localized swelling of the clavicle usually following recent injury, a rapid increase in size, and a fairly characteristic X-ray picture will usually make an early diagnosis comparatively easy without the necessity for an exploratory operation.

5. Local removal of the tumor or even a limited partial resection should be avoided. The treatment of choice, while the tumor is in an operable stage, should be: (1) total excision of the clavicle as soon as the diagnosis is made; and (2) a course of systemic treatment with the mixed toxins of erysipelas and bacillus prodigiosus which should be begun as soon as possible after the operation, continued for at least six months, and, when possible, supplemented by local or regional treatment with radium or the X-rays.

6. The mortality of total excision of the clavicle under modern treatment is very low and the functional use of the arm remains unimpaired.

EMIL C. ROBITSHEK.



**Owen, W. B.: The Treatment of Knee-Joint Infections.** *Am. J. Surg.*, 1920, xxxiv, 202.

This article touches briefly on infections of the knee joint other than purulent arthritis resulting from trauma, and reviews the important recent literature regarding the operative methods of treating arthritis of the purulent type. Willems does an arthrotomy, leaves the wound wide open, and then begins "immediate active mobilization" in which the patient himself moves the joint by muscular effort. The author draws the following conclusions in regard to the Willems method:

1. The Willems method in suppurative arthritis produces free drainage of pus, promotes the circulation of synovial fluid with the maximum power of resistance, and stimulates the blood supply to the joint.

2. The practical requirements of treatment are: (1) free drainage, and (2) active movement.

3. Reports have shown that in about 50 per cent of the cases treated a useful mobile joint has been obtained.

4. The Willems method should not be employed if delayed until the fulminating stage of suppurative arthritis has been reached.

For deformity and stiffness following any type of knee-joint infection Owens advises physiotherapy. If an infected knee joint is to be opened, cleaned out, and closed immediately, operation must be performed early and all foreign material must be removed. If drainage is necessary it must extend only to the capsule and not into the joint.

Owens usually makes an incision varying from  $1\frac{1}{2}$  to 2 in. in length, parallel to the inner and outer border of the patella and extending into the joint, and then thoroughly washes out the joint cavity for twenty minutes with a 1:15,000 mercuric chloride solution. He then closes the capsule and other layers immediately, applies a plaster cast, and later institutes physiotherapy.

The histories of cases of this type show that early operative treatment is extremely urgent if the joint or limb is to be saved. When joint infection is complicated by serious bone injury or injury to the femoral or popliteal artery or nerve, amputation is advisable.

LIONEL D. PRINCE.

**Beust, A. T.: Osteitis Fibrosa and Bone Cyst with Congenital Fracture of the Tibia** (*Ostitis fibrosa und Knochencyste bei angeborener Unterschenkel-fraktur*). *Deutsche Ztschr. f. Chir.*, 1920, clii, 60.

The case reported was that of a boy 7 years old. When he was three weeks of age curvature of the left tibia above the malleoli was observed. About six months later the bone was fractured at the site of the curvature but did not heal. Suture of the bone after four weeks was unsuccessful. The leg was movable at the lower third of the tibia and the growth of the tibia was retarded.

When the child was  $6\frac{1}{2}$  years old a bone inlay was applied but the operation was unsuccessful. The femur was then 1 cm. longer, and the tibia  $9\frac{1}{2}$

cm. shorter, than the corresponding bones of the other leg. At the juncture of the middle and lower thirds of the tibia was a pseudarthrosis. The X-ray showed that the cortex and spongiosa were definitely developed at the proximal end of the upper fragment but the cortex was smaller in the upper diaphysis, thicker than normal lower down, and at the site of the fracture filled the medullary cavity entirely. The distal fragment was cone-shaped with a rather pointed end. The spongiosa was apparent only in the epiphysis and the adjacent parts of the diaphysis. The larger part of it was revealed as a light homogeneous mass surrounded by a thick cortex shadow 1 cm. wide. The shadow of the lower end of the fibula was also light and indicated an interwoven structure. The structure of the astragalus seemed to be similar, but the rest of the bones of the foot approached the normal rather closely.

The insertion of a bone and periosteal flap from the upper fragment between the two ends did not overcome the pseudarthrosis. Ten weeks later the lower end of the tibia was resected and an osteo-periosteal graft made from the healthy tibia was inserted so that its upper end extended about 1 cm. into the upper fragment and its lower end into the apparently healthy astragalus. The lower fragment consisted of periosteum and a thin layer of bone which could be easily compressed and torn, and contained a bloody marrow-like fluid.

One year later a definite callus had formed at the ends of the graft, but a pseudarthrosis was again present as the graft had become loosened from the upper end. Tissue sections from the lower fragment consisted principally of interwoven fibers, fatty tissue, and hyaline cartilage. In the wall of the cyst the fibrous tissue had become changed to bone and cartilage, while near the margins it had been changed to calcium-free and calcium-containing tissue and osteoclasts.

The author states that there is a direct relationship between congenital fracture and bone cyst assuming histologically the picture of osteitis fibrosa and that congenital fractures may be due to osteitis fibrosa.

GUEMBEL (Z).

**Freiberg, A. H.: Injuries to the Sesamoid Bones of the Great Toe.** *J. Orthop. Surg.*, 1920, n.s. ii, 453.

A number of articles have appeared in which the significance of symptoms assigned to the region of the metatarsophalangeal joint of the great toe on its inferior aspect has been discussed. In the cases reviewed the X-ray showed for the most part that the mesial or tibial sesamoid bone was divided by a transverse cleft into two parts which in some instances were of nearly equal size and in others very unequal.

The observation has been made also that both of the sesamoid bones of the great toe are sometimes divided congenitally. In examinations of 100 clinically normal feet Geist discovered that



congenital division was present in 16. Little found a transverse division of the sesamoid in only 1 plate in 1,000.

The sesamoid bones of the great toe are not rarely the seat of traumatic damage and are subject to all of the varieties of trauma to which the patella is exposed. In a general sense the mechanism of the injuries in both cases is the same.

In one case of luxation of the mesial sesamoid there was marked local swelling and the sesamoid could be plainly felt on the inferior and mesial aspect of the joint. The bone was removed under local anæsthesia and the diagnosis confirmed.

These cases are not those which arouse the greatest interest, but rather those in which the X-ray plate shows the division to be more or less transverse and the patient is unable to furnish a definite history of violence from without or of sudden onset of the condition. In nearly all of the cases reported complaint was made of recurring cycles of pain in standing and walking, with swelling of the great toe joint which subsided after the activity ceased and reappeared after it had been resumed for a time. The tenderness was quite characteristic in its location over the mesial sesamoid. The X-ray plate, which was relied upon for the definite diagnosis, showed a cleft dividing the bone into a distal and a proximal fragment. In most cases these fragments were unequal in size.

Cases of this kind have been reported by various observers in considerable numbers but there is a difference of opinion as to the significance of the X-ray picture chiefly for the reason that it seems beyond question that division of the sesamoid not infrequently occurs as a congenital anomaly and without producing symptoms. Freiberg states, however, that it is possible to distinguish between the X-ray pictures of traumatic division and congenital cleavage. The fracture shows sharp and pointed corners, whereas in congenital cleavage the ends are apt to be more rounded; the ends of the fracture line show a break in the cortical substance, while in congenital cleavage this is continued around; and the fragments of the traumatic variety are of irregular shape whereas the congenital sections are usually oval. Another finding indicating fracture is the evidence of reparative activity.

The mechanism by which the symptoms are produced is the same, whether the division of the sesamoid is congenital or due to trauma. When in the act of rising on the toes the great toe is abducted to a certain degree, the sesamoids, and more especially the mesial, act as a fulcrum upon which the weight falls. According to the extent to which the power of the long flexor has become weakened, as by the effect of certain types of shoes, the stress upon the sesamoids in the short flexor becomes greater in this position. The sesamoid may thus become the site of a cross breaking strain which may separate it into two parts, or if a general cleft occurs, may result in damage to the fibers which connect the two segments.

The treatment consists at first of the application of a thick pad of felt immediately posterior to the point of tenderness and its retention by means of adhesive plaster. This pad should be replaced every few days until the tenderness is gone. An anterior heel or cleat of leather,  $\frac{1}{4}$  to  $\frac{3}{8}$  in. thick and  $1\frac{1}{4}$  to  $1\frac{1}{2}$  in. wide, should then be inserted between the layers of the sole of the shoe just behind the metatarsophalangeal joints and exercises should be instituted to develop the flexor power of the toes.

LEO C. DONNELLY.

**Monahan, J. J.: The Etiology of Bunions.** *Med. Times*, 1920, xlviii, 149.

The author discusses briefly and rejects the common theories as to the cause of bunions, namely, certain types of shoes, dislocation of the sesamoids, and heredity.

In the X-ray pictures of bunion-deformed feet he has noted three abnormal conditions: (1) abduction and outward dislocation of the phalanx; (2) enlargement of the internal lateral portion of the distal head of the first metatarsal bone; and (3) adduction of the first metatarsal bone.

The third condition he considers the underlying cause of the first two. The cause of the adduction of the metatarsal is a wedge-shaped development of the anterior end of the internal cuneiform with the apex of the wedge directed toward the inner border of the foot. At times this wedge is a separate bone — the "os intermetatarsum" described by Piersol — and at other times it is fused with the internal cuneiform.

The author conjectures that the development of the supernumerary bone is another of the numerous stigmata of degeneracy as a similar bone is found in the feet of animals in which the first digit is opposable.

BEVERIDGE H. MOORE.

## FRACTURES AND DISLOCATIONS

**Crile, W. D.: The Treatment of Septic Fracture.** *Illinois M. J.*, 1920, xxxviii, 144.

The records on which this article is based include 378 cases of septic fractures of the femur and 27 cases of septic fractures of the knee joint, many of which were treated at the Edmonton Military Hospital in England.

The author states emphatically that not only the fracture but also the whole limb, the muscles, fascia, nerves, skin, and joints above and below it must be taken into consideration. Perfect alignment will be of no benefit if capsular sclerosis and atrophy of the muscles about the joint, due to long immobilization, prevent function.

An active blood supply should be assured to all the tissues. Therefore tight bandages are contraindicated and free drainage should be effected when the tension of pus blocks the circulation.

When sepsis occurs from surface inoculation, free dependent drainage is advocated even at the sacrifice of large sections of muscle. Sepsis is combated also by the application of fomentations



or Carrel's treatment. A careful X-ray examination should be made and any sequestra immediately removed. Successful treatment depends chiefly on the early elimination of sepsis.

As soon as the infection is localized or eradicated massage and early action should be begun. To accomplish this an apparatus which will permit motion and massage of the soft parts to promote circulation while it maintains the reduction of the fracture is necessary.

The author condemns mechanical means of obtaining fixation in septic compound fractures.

Over 70 per cent of the patients with septic fractures of the femur who have been discharged from the Edmonton Military Hospital have good function and the others have serviceable legs.

ROBERT V. FUNSTON.

**Campbell, W.: Ununited Fractures of the Neck of the Femur.** *South. M. J.*, 1920, xiii, 585.

The neck of the femur is the most frequent site of non-union. This fact has been attributed to interruption of the circulation of the nutrient artery to the head, the inhibition of callus formation by the synovial fluid, the ordinary causes of non-union such as syphilis and the interposition of muscles, and, most frequently, failure of anatomical reduction. The resultant disability is permanent and progressive.

The author divides fractures of the neck of the femur into four classes according to their anatomical location and prognosis:

1. Fractures of the base of the neck, subtrochanteric, intertrochanteric, and trochanteric. These unite readily.

2. Fractures of the neck with the upper end of the distal fragment within the acetabulum. In such cases a good functional result may be obtained without bony union.

3. Impacted fractures. Impacted fractures may be united by simple rest in bed or any form of hip support.

4. Fractures of the neck proper, i.e., "central" fractures. This is the most frequent site of non-union.

Unlike other fractures, fractures of the neck of the femur are affected by non-union if they have not united by the end of eight weeks. The term "delayed union" is not applicable to this fracture. The X-ray findings are unreliable as to the degree of firmness of union. Absorption of the head and neck in an old ununited fracture may be shown by a skiagram made when the limb is in external rotation.

The treatment depends upon the individual case. The operation of choice is the insertion of an autogenous bone peg taken from the tibia or fibula through the trochanter, the neck, and head, preferably under X-ray control. As a rule the bone ends should be freshened through an anterior incision, but when conditions are unfavorable only a small incision should be made over the trochanter.

In the cases of old or debilitated patients, nailing to stabilize the joint is indicated. When there is marked atrophy and absorption the head and neck should be removed and the denuded trochanter inserted into the denuded acetabulum. Retention is facilitated by removing the trochanter proper and attaching it to the shaft at a lower level. In the young, simple paring of the edges with perfect apposition has been successful, but bone grafting is far more certain. Grafts are not used when marked atrophy of the head is apparent.

The graft is absorbed but osteogenesis is stimulated by the living transplant, whereas metal, boiled bone, ivory, and other foreign materials inhibit callus formation. DANIEL H. LEVINthal.

**Jones, S. F.: Fracture of the Tibial Spine.** *Colorado Med.*, 1920, xvii, 217.

In a review of the literature the author finds 23 cases reported in a series of 9 articles. These date back beyond 1873, up to which time only 3 cases had been reported. Operative interference was advocated first by Pringle in 1907.

Points of diagnostic interest in these cases are that the injury is caused by direct violence when the knee is semiflexed, there is considerable swelling and pain, and flexion is usually limited to between 15 and 35 degrees.

The author reports a case under his care and 6 others under treatment by his colleagues.

Emphasis is placed upon the fact that the internal semilunar cartilages usually escape injury, the pain is excruciating, and marked swelling may occur within a few hours. The lesion will be demonstrated in the X-ray plate and therefore a roentgen examination should be made in every instance.

In old cases the treatment is operative. The approach is made through the split-patellar route recommended by Sir Robert Jones. No wire should be employed.

If the case is seen early, ice bags and a simple ham splint are applied at first and later a plaster cast. Complete immobilization for eight or ten weeks is essential before active motion is allowed. The result is usually a complete cure.

ROBERT V. FUNSTON.

**Ammarell, W. H.: Fractures between the Ankle and the Middle of the Tibia.** *Pennsylvania M. J.*, 1920, xxiii, 602.

Fractures at the juncture of the center and the lower third of the tibia are comparatively frequent as this is the narrowest and weakest point, the nutrition of the lower third of the tibia is not as good as that in other parts because the nutrient artery enters at the upper third, and this area is frequently exposed to injury.

The fracture is usually oblique and extends from above and behind downward and forward. The upper fragment is displaced forward and the lower fragment upward and backward. The fibula is usually fractured a little higher up than the tibia.

In rare cases the tibial fracture is compound, a sharp spicule piercing the skin.

The symptoms consist of pain, crepitus, deformities, abnormal mobility, loss of function, and swelling. The swelling is usually severe and at its worst three or four days after the injury. Blebs due to the swelling require aseptic treatment.

In simple fractures without swelling a plaster cast should be applied after the limb has been elevated for thirty minutes. The cast must not be tight or too loose. Constriction by a cast is dangerous and evidenced by persistent or increased swelling of the toes, blueness, or pain. A cast that is too loose will not hold the fragments in apposition. If a cast becomes loose in two or three weeks it should be tightened or replaced.

In cases of swelling the blebs should be opened and dressed aseptically. If the swelling becomes alarming it may be necessary to open the leg and allow the extravasated fluid to escape, treating the incision aseptically. This is done best in a fracture box.

Whatever apparatus is used in the treatment the following points must be borne in mind:

1. The alignment of the bones of the leg must be maintained.
2. Rotation of either fragment on its long axis must be prevented.
3. The foot must be kept extended at right angles to the leg.
4. Lateral deviation must be prevented.
5. The anterosuperior spine of the ilium, the center of the patella, and the inner side of the great toe must be in a straight line.
6. The fracture should be inspected from both the anteroposterior and the lateral aspects.

MARCUS H. HOBART.

#### SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

**Rath, H.:** *Accident Surgery and Secondary Wound Healing* (Ueber Unfallchirurgie und sekundaeren Wundverschluss). *Nederl. Tijdschr. v. Geneesk.*, 1920, lxiv, 1707.

Rath recommends the application of war wound therapy as developed in France to accident injuries. Infected wounds should be disinfected by the Dakin method, and when the microscopic examination shows that the pyogenic organisms have almost disappeared they should be closed either by secondary suture or the use of Thiersch grafts. The advantages of this method are that the healing occurs within eight or ten days, contractions and scars do not form, and the period of convalescence is considerably shortened.

For secondary union the wound must be completely disinfected. There should be no dead tissue and the tension should not be too great. The wound should be well prepared twenty-four hours before the operation. The beginning scar tissue should be cut away and all superfluous granulation tissue re-

moved. Tendon and fascia or, when the latter is not feasible, fat flaps may be used to cover the wound, the skin margins being undermined. Catgut should be employed for the deep tissues and silkworm gut for the skin. Before grafting the wound must be well exposed and aseptic. The grafted area as well as the area from which the graft is taken should be covered before bandaging with Carrel's wax which has been melted over a water bath. This should be either sprayed on the wound or allowed to drip on it from a brush. It should then be covered with a thin sheet of cotton and over the cotton a second layer should be applied. This dressing may be removed in six days. The flaps remain on the wound as they do not adhere to the wax. The post-operative treatment consists in the use of Dakin's solution.

The composition of Carrel's wax is as follows:

Paraffin, melting point 52 degrees, 18 parts; paraffin, melting point 40 degrees, 6 parts; ordinary yellow wax, 2 parts; and castor oil, 1 part.

FLACKEMANN (Z).

**Lotsch, F.:** *The Healing Processes in the Conservative Treatment of Cystic Osteomyelitis* (Heilungsvorgaenge bei konservativ behandelter cystischer Knochenmarkfibrose). *Deutsche med. Wchnschr.*, 1920, xlvii, 620.

In proliferating fibrosis of the bone marrow there is a proliferation of the connective tissue elements of the marrow at the expense of the hæmatogenous elements and the bone tissue. The periosteum remains entirely unaffected. Frequently the giant cells of the bone marrow are involved in this proliferation (Eperlin). Through colliquation of the fibrous tissue cystic degeneration occurs. The cysts formed are not true cysts, however, as they entirely lack an epithelial or endothelial lining. The disease stops when the epiphyseal cartilage is reached. It is distinctly benign and therefore there is no indication for such radical procedures as resection or amputation. It is sufficient to lay open the focus and curette it thoroughly. The periosteum may very quickly undergo degeneration and pathologic fractures may occur very frequently. The roentgen-ray shows a more or less marked degeneration of the cortex, even when the periosteum remains intact.

The author followed up the healing processes by X-ray examination in a case of a single bone cyst of the humerus. Nine months after the injury the medullary cavity of the shaft appeared very clearly to be filled with calcium-containing bone substance.

WOLFSOHN (Z).

**Sarria, P. A.:** *A Contribution to the Study of Bone Transplantation* (Contribución al estudio de los injertos oseos.) *Prog. de la clín.*, Madrid, 1920, viii, 159.

In a very detailed consideration of the entire subject of bone transplantation, Sarria classifies the indications for the operation as follows:



1. Traumatic lesions in which there is extensive bone destruction, as in injuries of all sorts, complicated fractures, destruction due to prolonged suppuration, fractures in which coaptation cannot be effected, and pseudarthroses.

2. Bone diseases such as bone cysts, osteomyelitis, bone tuberculosis, osteitis fibrosa, and neoplasms such as sarcoma, myeloma, adamantinoma, etc.

3. Congenital absence of bone.

4. Deformities, either congenital or acquired, as in aplastic bones of the extremities, saddle nose, aplastic mandible, etc.

Transplants have been made of many materials. The use of foreign bodies, such as metal, gum elastic, ivory, etc., has been abandoned, however, as regeneration does not occur when such materials are employed. Transplants of bones of animals usually die because of the changed serological reactions in their new environment. When dead human bones, which have been dried and prepared in a special way, are used, the transplant undoubtedly acts simply as a support. With its absorption regeneration of living bone fills the defect.

The most successful method according to our modern conception is that in which autotransplants are employed, the bone graft being taken from the same individual into which it is to be transplanted and consisting of the cortex with its periosteum and endosteum. Such grafts may be taken from another part of the bone which is to receive the graft, as in the Albee inlay graft method, or from an entirely separate bone. In certain cases a portion of the tenth rib has been transferred to the inferior surface of the ulna, and in others, to the mandible. Fragments of the tibia of various sizes and shapes may be taken from the anteromesial surface without impairing the function of the leg, and the loss of bone is soon made up in regeneration. Such grafts may be used in most of the long bones of the body, in the Albee operation for Pott's disease, and in the treatment of cranial defects.

As bone transplants will not survive in any considerable degree of infection, asepsis plays a major role in the technique of transplantation. The operative field is shaved forty-eight hours before the operation, and just before the transplantation it is mechanically cleaned and alcohol and iodine are applied. The transplant is removed best by circular saws of various sizes, either single or parallel, driven by an electric motor. Care must be taken to preserve the periosteal covering. The transplant is not touched by the hand, being held by forceps as it is placed in the bed previously prepared for it. The ends of the transplant are fixed into the adjacent ends of the living bone either by allowing the graft to impinge into the medullary canal or by fastening it with sutures of kangaroo tendon. The transplant should never be fastened with non-absorbable foreign materials as these act as irritating bodies.

As to the ultimate fate and function of the transplant authorities differ. Some maintain that the

graft dies and serves only as a stimulus to natural bone production. Others claim that the bone is re-absorbed and that new bone is formed only by the periosteum of the graft. Still others claim that proliferation is due to osteoblasts within the bone itself and that the periosteum does not produce bone tissue. Probably the most generally accepted theory is that regeneration of bone takes place not only from the periosteum but also from the endosteum and osteoblasts about the haversian systems.

Details of several case histories are given with illustrations of the author's special technique.

WILLIAM R. MEEKER.

#### Zadek, I.: The Correction of Congenital Club-Foot in Infants. *J. Am. M. Ass.*, 1920, LXXV, 536.

The author believes that the most satisfactory time at which to begin the treatment of congenital club-foot is when the child is two weeks old. The object of treatment is to correct the deformity and to secure a relatively normal amount of motion. These results may be secured by considerable over-correction maintained for many weeks.

There are two types of club-foot as regards shape: the long foot of relatively normal size, and the short, thick foot which is particularly broad in the fore-part. The latter type is usually more difficult to treat than the former.

The varus must be completely corrected before the correction of the equinus is attempted as the normal relationship of the astragalus must be restored before dorsal flexion is begun.

The author advocates the use of plaster of Paris changed at intervals of two weeks. The correction should be continued until the dorsum of the foot is against the lower part of the leg. This position should then be maintained for six or eight weeks. To keep the child from kicking the cast off, an adhesive strip may be placed on each side of the leg and incorporated into the plaster.

After the equinus is overcome, the correction is best maintained by adhesive strips. To prevent cutting of the adhesive at the base of the great toe, several thicknesses should be used at this point. After the adhesive is removed, the child's mother should be instructed to put the foot through the full range of motion opposite the original deformity frequently during the day.

In some instances retention splints may be necessary, but usually when the case is properly supervised no splint is required. When the child begins to walk the outer border of the shoe should be raised  $\frac{1}{4}$  in.

Sometimes, despite much effort and the division of the Achilles tendon, the equinus cannot be overcome manually. In such cases the short posterior ligaments must be cut subcutaneously and the foot then put up in plaster in the calcaneovalgus position.

The author believes that relapses of congenital club-foot treated early are due chiefly to the lack of sufficient treatment.

DANIEL H. LEVINTHAL.

ORTHOPEDICS IN GENERAL

**Marshall, H. W.:** *The Muscles and Ligaments of the Lumbar and Pelvic Regions: Their Mechanical Arrangement and the Treatment of Their Weaknesses.* Boston M. & S. J., 1920, clxxxiii, 201.

In his discussion of the mechanical arrangement and the variable strengths of the muscles and ligaments of the back Marshall illustrates the mechanical anatomy and points of possible pathology by means of diagrams and describes the mechanical supportive treatment which should be given in the treatment of their weaknesses. The principles have been carefully thought out. A proper understanding of them can be obtained only from a careful reading of the original article.

In the discussion of the different types of belts and braces used in conditions of this nature a belt is described and illustrated which, with the aid of attached rubber cords, reinforces the pelvic sacro-sciatic ligaments and gluteal muscles. Longitudinal rotation of the sacrum can be controlled only by reinforcing the longitudinally acting ligaments and muscles. Ordinary belts and braces do not do this, and plaster spicas and the extension apparatus in recumbency have their disadvantages. The appliance described gives fixation and support without limiting leg motion or causing discomfort.

The author emphasizes the importance of combining proper physiotherapy with mechanical support. Any method of therapy which uses one to the exclusion of the other should be abandoned.

LIONEL D. PRINCE.

SURGERY OF THE SPINAL COLUMN AND CORD

**Johanson, N. A.:** *A Surgical Operation for Lumbago and Sciatic Rheumatism.* Northwest Med., 1920, xix, 195.

The author calls attention to a class of patients who complain of pain in the lumbosacral region and along the sciatic nerve. This condition is always afebrile.

The pain, which may be continuous or intermittent and very severe, may be due to a variety of causes, but in this article the author confines his attention to deformities of the fifth lumbar vertebra of congenital origin with chronic osteo-arthritis and osteitis in the lumbar spine.

The varieties of deformity of the fifth lumbar vertebra include: (1) excessive thinness of the body, (2) greater thickness on one side than on other, (3) very long transverse processes which impinge on the ilium or fuse with the sacrum; (4) displacement of the vertebrae, (5) irregularity in the size and development of the pedicles, and (6) irregularly developed laminae which have failed to fuse. There may be also deformity of the upper sacral segments. The osteo-arthritic changes are like those in other locations.

In the author's opinion we should consider surgical only those cases in which there is a definite deformity of the fifth lumbar vertebra due to a congenital defect or changes incident to chronic osteo-arthritis.

When merely osteo-arthritic changes are present Johanson removes the original focus if possible before proceeding with the spinal operation.

In the spinal operation the attempt is made to produce a permanent ankylosis, as in operations for tuberculosis of the spine, by inserting a bone graft from the tibia extending from the third lumbar to the first sacral vertebra. A posterior plaster cast is then applied and the patient kept in a Bradford frame bed for six weeks. The cast is removed in three weeks. In the six cases treated in this way the results were successful in all except one in which the graft became infected. MARCUS H. HOBART.

**Williamson, R. T.:** *The Diagnosis of Spinal Meningeal Tumor and Its Practical Importance.* Brit. M. J., 1920, ii, 275.

In 100 collected operative cases of spinal meningeal "tumor" the character of the growth was as follows:

Malignant	Non-malignant
Sarcoma.....23	Fibroma.....14
Fibrosarcoma.....17	Hydatid cyst.....17
Endothelioma.....11	Psamomma.....6
Gliosarcoma.....1	Fibromyxoma.....2
Psammosarcoma.....1	Myxoma.....1
Myxosarcoma.....1	Lipoma.....1
Fibromyxosarcoma.....1	Angiolipoma.....1
—	Lymphangioma.....1
55	Fibro-angioma.....1
	Gumma.....1

45

Sarcoma, hydatid cyst, fibrosarcoma, fibroma, endothelioma, and psamomma were, in the order named, the most frequent tumors found. These growths, which are usually solitary, are often easily enucleated. Metastasis seldom occurs in the malignant cases.

The chief symptoms of a spinal meningeal tumor are root pains, unilateral or bilateral, followed later by signs of cord compression. The latter may at first be unilateral (Brown-Séquard lesion) and subsequently bilateral (paraparesis and paraplegia). The root symptoms are mainly pains in the sensory distribution of one or two spinal roots which may be followed in time by diminished sensation in the same area as the pain. Later paresis or paralysis may develop, coming on slowly or suddenly in one limb or both.

The chief reflexes may remain normal for some time following the onset of paralysis, but are eventually lost, and the Babinski and clonus reflexes appear. Partial or complete anaesthesia to touch, pain, and temperature develops and, early



or late, the bladder becomes paralyzed. The symptoms indicate a localized lesion, and extension is usually of the cross-section type.

Three groups of cases may be considered in the differential diagnosis: (1) those in which root pains are noted but paralysis has not yet developed, (2) those in which paraplegia has developed and has followed definite root pains, and (3) those in which paraplegia has developed, but root pains have been indefinite or absent.

The early diagnosis of cases in Group 1 is difficult, the condition having been confused with stone in the kidney, gall-stones, flatulence, intestinal colic, and intercostal neuralgia. If tabes dorsalis is excluded, bilateral pains limited to a few spinal roots and diminished cutaneous sensibility over the same area are suggestive of tumor. If root pains are felt in the arm or cervical rib, primary brachial neuritis, intrathoracic aneurism or new growth must be considered in the differential diagnosis. The diagnosis of primary brachial neuritis is correct only when confirmed by subsequent recovery.

In Group 2 conditions to be considered are those which produce paraplegia. Spinal syphilitic affections cause much confusion. A positive history of syphilis, a positive Wassermann reaction, and improvement under anti-syphilis treatment are helpful in the diagnosis. In acute syphilitic myelitis root pains are absent or slight and the paraplegic onset is rapid. In syphilitic meningomyelitis and in meningeal gumma root pains cover a wide area and are not localized. Occasionally, however, meningeal gummata are not diagnosed until the time of opera-

tion. In spinal pachymeningitis pain is bilateral and as a rule extends over a wide area.

Spinal caries may be eliminated by prominence of the vertebral spines, muscular spasm, and the X-ray examination. Vertebral tumors are mostly malignant and metastatic; the pain is severe, particularly on movement, and is felt in the spine as well as along the course of the nerves affected.

The fact that the symptoms of intramedullary tumor are practically the same as those of meningeal tumor greatly complicates the differential diagnosis.

In cases of syringomyelia, glioma, and gliosis there are usually no root symptoms. Trophic and vasomotor phenomena in the skin, bones, and joints are common, and as a rule extension is extremely slow and occurs in a vertical direction.

In Group 3 the diagnosis rests on symptoms indicating a progressive and transverse extension of the spinal cord lesion with a stationary upper limit.

Tumor cells have been found in the spinal fluid, and by some observers a yellow color (xanthochromia) is regarded as an indication of spinal tumor.

Hydatid cysts of the meninges produce the same symptoms as other tumors, but the diagnosis may be made by the finding of cysts in other parts of the body. These cases are particularly suitable for operation. Ten of 75 patients with hydatid cysts were operated on successfully.

Spinal meningeal tumor is not so rare as is generally believed. Careful consideration in early disease of the spinal cord would lead more frequently to its early recognition and to early successful operation.

A. C. JOHNSON.

## MISCELLANEOUS

### CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

**Love, R. J. M.: Some Surgical Complications of Dysentery.** *Practitioner*, 1920, cv, 11.

The author divides the cases reported into two groups, one group including those in which surgical treatment was necessary on account of lesions caused directly by the amœba or bacillus, and the other including those in which surgical treatment was necessary because of complications secondary to the dysenteric infection.

The treatment of the first group of cases and its results are summarized as follows:

Acute cases in which the onset was sudden and characterized by fever, diarrhœa, tenismus, and the passage of blood-stained mucus, and in which there was no reaction to medical or serum treatment gave very discouraging results.

In chronic cases which slowly retrogressed in spite of medical and dietetic treatment, three different operations were performed: appendicostomy, cœcostomy, and ileostomy. Appendicostomy permits direct lavage of the colon, but it has been proved by means of bismuth enemas that all of the

large bowel can be reached by injections given through the rectum.

Cœcostomy and drainage by Paul's tube gave better results, but drainage was never complete and the patient's condition seemed to vary with the amount of drainage.

Ileostomy appeared to be the most satisfactory operation. It puts the colon at complete rest as it prevents irritation by undigested food and the stimulation of peristalsis by the passage of fecal material.

Whenever a liver abscess was suspected the clinical symptoms and X-ray findings, blood examination, and exploratory puncturing with a needle generally confirmed the diagnosis. If pus was found, the needle was left in place and a portion of rib was excised as in cases of empyema. The costal and diaphragmatic pleura were then sutured and the diaphragm incised at right angles to the direction of the muscle fibers so that its contractions would not interfere with drainage. The needle being used as a guide, the liver tissue was then gently broken down until the abscess was reached. The abscess was drained with a rubber tube wrapped in gauze and the area irrigated with quinine solu-



tion. If the abscess was found to point toward the abdominal cavity, it was opened and drained through an abdominal incision. The prognosis of these cases was invariably grave.

The results in the second group of cases are summarized as follows:

Peritonitis developed in some cases because of devitalization of the bowel wall or leakage due to a dysenteric ulcer. Suture of the devitalized bowel wall proved to be very unsatisfactory and in most instances it was necessary to be content with drainage and hope for the formation of a fæcal fistula.

The differentiation between appendicitis and a typical dysenteric ulcer of the appendix is very difficult. Operation was performed in all cases in which there was pain in the right iliac region associated with symptoms of appendix trouble.

Parotitis is probably due to direct infection from the mouth along Stenson's duct. Many of the cases of this condition were relieved by increasing the flow of saliva, but when suppuration was present it was deemed advisable to make an incision below the angle of the jaw and evacuate the pus.

Arthritis should not be confused with the joint symptoms arising from the injection of anti-dysenteric serum. In the cases reported the joint most commonly affected was the knee joint. In a few instances the wrist and shoulder were involved. No treatment was given, however, as the inflammation gradually subsided as the patient regained strength.

In most cases of perinaphritic abscess incision and drainage proved to be the most satisfactory procedures. When the operation was performed early improvement was rapid.

The rectal complications of dysentery included hæmorrhoids, prolapse of the rectum, and carcinoma. These were treated successfully by the routine surgical measures. HAROLD K. BEGG.

**Lawrence, C. H.: Observations upon Ductless-Gland Therapy.** *Boston M. & S. J.*, 1920, clxxxiii, 160.

The author emphasizes the various symptoms and syndromes found with dysfunction of each of the endocrine glands and states that it is most important to determine which gland is not functioning properly. Also of paramount importance, if results are to be expected from treatment, is early treatment of the disease and this depends chiefly on a well taken history.

The patient with slight malfunction of the thyroid complains of symptoms which are referable to disorder of the nervous system primarily. Such symptoms are associated also with disturbances of other glands, but in such cases do not occupy so prominent a position in the picture. A history of the character indicated accuses the thyroid gland. An increase in the basophiles in the blood, a pathologic response to the Goetsch test, and an abnormal basal metabolism make suspicion a certainty.

Contrasted with the neurological tinge which dysfunction of the thyroid gives to the history, disorders of the adrenals are characteristically expressed in alterations of ability to mobilize energy. Thus hypo-adrenalism is associated with weakness of both voluntary and involuntary muscle. This condition appears in the history as easily induced fatigue, loss of muscular power, circulatory disturbances and the like, but the altered nervous and psychic reactions are not present in any striking degree. Laboratory tests often disclose anæmia and hypoglycæmia.

In ovarian dysfunction the influence of the gland upon the blood flow suggests that its most dominant activity (if its influence on sex characteristics is excepted) is related to the circulation. The phenomenon of catamenia is the most striking evidence of normal ovarian activity, and the symptoms caused by abnormal activity logically express themselves in disturbances of the circulation. Flushing, headache, variable blood pressure, or similar evidences of unstable circulatory equilibrium are the most common and the most important symptoms.

Disorders of the pituitary body cause a most complex picture since the structure is really two glands with separate functions. There may be over or under-activity of either part separately, or both parts together, or over-activity of one lobe and simultaneous under-activity of the other. In cases of early pituitary dysfunction the symptoms suggest in a mild degree the phenomenon of hibernation. An abnormal desire to sleep, aversion to effort, without weakness, and deranged carbohydrate metabolism are the most constant symptoms.

Lawrence cites a case of dysfunction of the pituitary gland in which the prominent symptoms were those of a disturbance of the metabolic processes, rapid growth at about the age of 16, an abnormal desire for sleep, and under-weight. The patient was given whole pituitary substance by mouth and gained 17 lb. in weight. The metabolic disturbances then ceased completely as long as she continued taking the glandular substance.

The selection of the proper glandular preparation is probably the most important point in the treatment of endocrine derangements, but there are other factors which, if neglected, will postpone or vitiate the results. Most of these early glandular derangements are sequelæ of infections or prolonged overstrain. Therefore rest is important and is sometimes sufficient to re-establish normal glandular activity without other measures.

When the patient's tolerance for the preparation is established, the dose should be increased until some effect, either good or bad, is noted. The proper dose in any case is the same as that of any other drug—sufficient to give results. If a small dose is tried first, and the patient is watched closely, serious untoward effects are not apt to follow. If adequate amounts of the preparation produce no results, there are two courses to pursue: first, it must be



demonstrated that the preparation employed is active, and second, if the preparation is found to be active, then the extract of another gland should be tried, the one which stands second in the list of probabilities being chosen. If then no single glandular extract proves beneficial, it becomes logical and reasonable to employ combinations of synergistic extracts. Such combinations should be made as the symptoms warrant.

EUGENE CARY.

### BLOOD

**Busman, G. J.: Rubber Tubing as a Factor in the Reaction to Blood Transfusion.** *J. Lab. & Clin. Med.*, 1920 v, 693.

In an article in the *Journal of the American Medical Association*, April 10, 1920, Stokes and Busman of the Mayo Clinic described the reactions of patients receiving intravenous injections of arsphenamine and alkaline solutions through a certain brand of rubber tubing. The fact that a number of persons have been observed to experience a similar reaction following blood transfusion by the citrate method led Busman to study the possible relation of this reaction to new rubber tubing. Although the transfusion reaction in question is not so severe as that following the intravenous administration of arsphenamine through new tubing, a chill comes on from one-half to one hour after the injection and, with a gradual rise in temperature, there are varying grades of prostration and occasionally nausea and vomiting.

The striking success of duplicating in dogs the reaction following intravenous injections of arsphenamine in man led the author to use this animal in his study of the transfusion reaction. In order to approach the technique of transfusion in man as nearly as possible the experiments were performed under rigid asepsis. With continuous stirring, blood was drawn into sterile flasks containing 2 per cent sodium citrate solution until a concentration equivalent to 30 ccm. of citrate solution to 250 ccm. of blood was reached. In every instance each dog was given a transfusion of his own blood.

From this series of experiments the following conclusions were drawn:

1. The supposedly pure gum rubber tubing which in preliminary experiments by Stokes and Busman produced a reaction when intravenous injections of arsphenamine were given is apparently able also, when new, to produce a reaction if used in blood transfusion.

2. The toxic substance is taken up in sufficient amounts to produce a reaction in patients receiving transfusions of citrated blood through 80 cm. of new rubber tubing 4 mm. in internal diameter.

3. Enough of the toxic agent is taken up by 250 ccm. of normal uncitrated blood drawn through as little as 35 cm. of new rubber tubing (internal diameter 4 mm.) en route from the vein to the container of the citrate solution to produce a marked reaction when given through an old tube. Therefore

it is not necessary that whole blood be citrated for it to absorb the toxic principle.

4. The mechanically removable débris from the inside of new sterilized tubing does not produce a reaction when given in suspension in distilled water or 0.18 per cent sodium hydroxide solution.

5. The toxic agent may be removed from new tubing by soaking the tubing in normal sodium hydroxide solution for six hours.

The author does not assume that rubber tubing is responsible for all transfusion reactions which present chills, fever, prostration, etc., but regards it merely as one factor. He is still investigating the identity and toxicology of the poisonous principle.

**Bloch, M.: Coagulation of the Blood: A Study of the Anti-Coagulant Action of Sodium Citrate and of the Part Played by Calcium in the Blood.** *Lancet*, 1920, cxcix, 301.

The author calls attention to the inadequacy of the methods generally used at present in determining blood coagulability. While they serve fairly well to demonstrate states of decreased coagulability, they lend themselves with the utmost difficulty to the determination of states of increased coagulability. To be satisfactory a method *in vitro* must permit the immobilization of the forces of the coagulation reaction without in any way impairing them and must also permit the initiation of the reaction again at will.

The action of sodium citrate differs in two ways from that of the two other most frequently used anti-coagulating salts, the oxalates of potassium and sodium and the fluorides of sodium. Coagulation may be made to occur in citrated blood by the addition of extraneous calcium ions, but this is not possible if coagulation has been prevented by the use of the fluoride or an excess of the oxalate. A second difference may be observed in the antagonistic action of sodium citrate toward the precipitation of salts. The alkali oxalates and fluorides do not have such anti-precipitative qualities.

In considering the action of the citrate on the blood calcium the author quotes the view of Sabatani who holds that while the citrate does not precipitate the calcium in the blood, it modifies its state of ionization and thus annihilates it functionally.

Another view of the action of calcium in the blood is based on the conception of the blood plasma as a colloid and considers the action of sodium citrate on certain colloidal phenomena. Normally, in coagulation, calcium plays the rôle of an "electrolyte" which tends to precipitate the solution, but the presence of the citrate entirely prevents this by placing the calcium in what is termed an inactive hidden state. In the light of this conception, the author suggests the hypothesis that the calcium exists in the circulating blood in an inactive latent state, and that even the simplest changes in its physical reactions may be sufficient to convert it into an active electrolytic precipitant and thus



effect coagulation. Advancing further, he states that the activated calcium may be regarded as a catalyzer and that this conception does not conflict with the older enzymic theory of coagulation.

In verifying and applying this hypothesis to clinical states Bloch has evolved and briefly described a method for revealing experimental and pathological variations of coagulability of much broader usefulness than the older methods. It allows also a most exact study of the qualities of the coagulation.

Bloch has been able to show that sudden profuse hæmorrhage is followed by a primary rapid fall in coagulability which is followed after some hours by an increased coagulability. Similar changes occur in anaphylactic shock. In small protracted hæmorrhage only hypercoagulability is present as a rule.

Coagulability has been found decreased in affections of the liver associated with marked hepatic insufficiency, in lesions of the kidney such as Bright's disease, in cardiac affections, mechanical pulmonary congestion, influenza, typhoid, miliary tuberculosis, and certain polyglandular and endocrinous disturbances. In this connection it has been claimed that coagulation is disturbed in the menorrhagias of women who present evidences of ovarian, thyroid, pituitary, or adrenal insufficiency.

Disturbances of coagulation, however, must not be regarded as the sole pathology in cases presenting the hæmorrhagic diathesis. Attention is called to the fact that an endotheliovascular insufficiency or dystrophy may be present and must be considered.

By recognition of these two factors, nice distinctions may be made between the various types of purpuras and thromboses and true hæmophilia may be distinguished from hæmophilic states.

H. W. BACHMAN.

#### BLOOD AND LYMPH VESSELS

**Haeller, J.:** The Surgical Treatment of Popliteal Aneurisms (Zur chirurgischen Behandlung der Aneurysmen der Arteria poplitea). *Deutsche Ztschr. f. Chir.*, 1920, clii, 169.

After discussing the anatomical relations of the popliteal space the author describes various types of injury of the popliteal artery. In cases of subcutaneous rupture gangrene usually sets in, and in the development of the gangrene the rapidly forming hæmatoma plays an important part. This condition was observed after gunshot injuries and made rapid surgical intervention necessary. It is therefore advisable to attempt to suture the vessel whenever possible. In most cases of war injuries gangrene is not so common because the blood has an opportunity to escape and severe pressure is avoided. Vessel suture is the operation of choice.

Early surgical treatment is advised by many as vessel suture can be performed even in an infected area. If urgency does not demand it, however, the author believes that operation should be performed

during the fourth or fifth week when the field is clean and the collateral circulation has become established. Various methods to determine this are described. Compression of the sac for a few weeks prior to the operation is advisable if the dilation is a distinctly arterial aneurism. In arteriovenous aneurism the central ends of both vessels are dilated so that the development of collateral circulation is favored. In such cases the condition of the venous system often necessitates operation. The artery, if obliterated, may be ligated.

In concluding his article the author reports three cases of his own, two of arteriovenous aneurism due to a gunshot injury and one of arteriosclerotic aneurism. Ligation was performed twice and vessel suture once. A cure was obtained in every instance.

J. WINTWARTER (Z).

#### SURGICAL DIAGNOSIS PATHOLOGY AND THERAPEUTICS

**Glass, E.:** The Treatment of Surgical Tuberculosis with Injections of Turpentine (Zur Behandlung chirurgischer Tuberkulose mit Terpentininjektionen). *Deutsche med. Wchnschr.*, 1920, xlvii, 687.

The excellent results obtained with injections of turpentine reported by Klingmueller have been corroborated by the author in a number of skin cases. The method of Wederhake (turpentine-iodoform-glycerine and 5 per cent tannin solution) proved impracticable for the one-hour clinic. In the beginning, all other treatment having been stopped, tuberculous patients were given twice a week injections into the gluteal region of 1 ccm. of a solution of turpentine in olive oil (2.0:20.0). These injections alone had no effect on the healing process. When injections of iodoform glycerine (10 per cent) into the caseated foci and daily heliotherapy were added to the turpentine injections, however, definite improvement was observed in a series of cases.

Twenty per cent turpentine causes fever and pain at the site of injection but the 10 per cent solution does not. Several cases were treated for ten months. Kidney injuries were not observed although in 3 cases at least 60 injections were given, and 1 patient received 88. The report is based upon 23 cases which have been re-examined.

GUEMBEL (Z).

#### EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

**Swartz, E. O.:** A New Culture Method for the Gonococcus; Report of Experimental Studies. *J. Urol.*, 1920, iv, 325.

The author has found that the presence of reduced oxygen tension is essential for the profuse growth of the gonococcus. A reduction of 10 per cent of normal atmospheric pressure is sufficient. Moisture also is essential.

The most luxuriant growth is obtained in media rich in human protein.



A profuse growth of the gonococcus may be obtained on media the reaction of which varies between pH 6.6 in the acid range and pH 8.0 in the alkaline range of the hydrogen-ion scale if the incubation is carried out under partial oxygen tension.

Details are given for the preparation of a medium which has been proven satisfactory for the primary culture and growth of the gonococcus. In addition, an extremely reliable method is described for reducing the oxygen tension in culture tubes.

SAMUEL KAHN.

**Silvestrini, L.: Experimental Research Regarding the Changes in the Hepatic Tissue Following Splenectomy** (*Ricerche sperimentali sulle modificazioni del tessuto epatico in seguito all'asportazione della milza*). *Arch. ital. di chir.*, 1920, ii, 165.

The author has studied the changes in the liver following splenectomy in 32 rabbits. His findings are summarized as follows:

1. Following the extirpation of the spleen in rabbits, an operation generally well tolerated, nothing very special is observed in the liver at first except a diminution in the bile. This is due probably to a decrease in the biliary secretion caused by the partial suppression of the portal circulation.

2. Later the liver increases slightly in weight and the microscopic examination shows a lymphatic hyperplasia appearing first about the portal vessels and then about the hepatic lobules. This is due probably to compensatory activity of the deep lymphatic elements of the liver and doubtless explains the increase in the weight.

3. Next, a slight and transitory alteration of the hepatic cells in different parts of the liver is observed. Subsequently the liver returns to its normal state but the numbers of leucocytes within its tissues are increased.

WILLIAM A. BRENNAN.

**Sabucedo, C.: A Contribution to the Histopathologic Study of the Suprarenal Glands in Tetanus Intoxication** (*Contribución al estudio histopatológico de las capsulas suprarenales en la intoxicación tetánica*). *Siglo méd.*, 1920, lxvii, 283.

Sabucedo injected into rabbits doses of tetanus toxin sufficient to produce tetanic spasms of five or six days' duration. When near death the animals were killed and the suprarenal capsules rapidly extracted and fixed in Muller's fluid. This fluid hardened them to a point convenient for frozen sections and at the same time colored the chromaffin substance. Some of the sections were stained in hæmatoxylin followed by Sudan III and mounted in glycerine which gives a characteristic color to the lipoids of the cortex. Other sections of the same specimen were then stained in hæmatoxylin and eosine without differentiating the nuclear tint in acid solution in order that the chromaffin reaction might not be altered.

These investigations demonstrated that the lipoids in animals dying from tetanus are present in the same quantities as in normal animals but that often

the drops of lipoids appear somewhat larger. The marked changes occur in the medullary portion. Chromaffin cells show necrotic changes, many nuclei being in advanced stages of pycnosis and others showing chromatolysis. The chromaffin substance is scarce. Occasionally it is absent entirely in certain zones, but more commonly is disseminated in the cellular protoplasm in the form of small granules of a clear ochre color. This is interpreted as a sign of scarcity of adrenalin. Such a scarcity may be due either to insufficient production or excessive consumption, but probably both processes go on at the same time. The treatment of tetanus with adrenalin in addition to the specific antiserum is therefore in accordance with experimental histopathologic observations.

WILLIAM R. MEEKER.

#### ROENTGENOLOGY AND RADIUM THERAPY

**Davis, J. S.: The Radical Treatment of X-Ray Burns.** *Ann. Surg.*, 1920, lxxii, 224.

Although today X-ray burns are comparatively rare, the author has had a number of cases under his care during the past ten years.

The burns are now usually caused by the use of X-rays in the treatment of skin diseases. Considerable time may elapse after the exposure before the extent of the damage becomes apparent. Some very severe burns follow single exposures while others result from multiple exposures.

X-ray burns may be superficial or involve the full depth of the skin and a considerable amount of the underlying soft parts. The history of many of them is that they heal slowly and then break down, this process being repeated over and over. Some never heal without operative interference.

The edges of the ulcers are thickened and grayish-red in color, very hard, and often everted. The clinical appearance is suggestive of malignancy.

Exquisite sensitiveness is characteristic of the deep burns. The pain may be due to irritation caused by infection, changes in the nerves, pressure exerted on the nerves by scar tissue, or any combination of these factors. In some cases intense pain after spontaneous healing may make operative interference necessary.

The author's experience has been that the tendency toward malignant degeneration in these burns is no more marked than that in any other chronic ulcer. This tendency is distinct, however, when chronic ulceration follows the breaking down of a patch of keratosis such as is found on the hands of the roentgenologist.

Recent X-ray burns of any degree should be treated at first as ordinary burns, but unless the response to such treatment is prompt, it should not be continued. In cases of burns of the first and second degrees palliative measures should be used. The author considers more especially in his paper the treatment of third degree burns. When burns of the third degree do not heal promptly and permanently following the usual therapeutic methods he



excises the ulcer and surrounding area of induration with a wide margin out and down to healthy tissue.

The affected tissues are of extreme hardness and the subcutaneous fat may be completely destroyed. In deep burns the muscle may be entirely replaced by dense scar tissue, or there may be varying degrees of infiltration with scar.

The bleeding is always marked after excision, and usually difficult to check. After excision the defect should be grafted immediately if the base of the wound is of normal tissue, but if doubtful tissue is left, grafting should be deferred until granulations form. The type of graft must depend upon the situation of the ulcer. Pedunculated flaps have been of great value in areas where a pad of fat in addition to whole-thickness skin was necessary.

The best method of relieving the pain, aside from excision of the affected area, is to divide the nerves supplying the area.

The writer has seen no benefit following the use of radium or the X-ray in the treatment of X-ray burns.

Patches of keratosis on the X-ray operator's hands may be successfully treated by freezing with carbon dioxide ice. Radium also may be used, but is less safe. If the patches ulcerate, complete excision with immediate or subsequent grafting is the method of choice.

The after-results of excision with grafting or flap shifting have been most gratifying. The author has no record of a case in which a break-down followed the thorough application of the method advocated.

**Boggs, R. H.: Lethal and Erythema Dosage of Radium in Malignancy.** *Am. J. Roentgenol.*, 1920, n.s. vii, 398.

In the treatment of malignancy the radiologist should be able to determine the amount of irradiation necessary to destroy the different types of malignant cells and should compare this amount with the erythema dose. This is essential for accurate data. Not all radiologists place the same interpretation upon the term "erythema dose." To some it means a dose which causes no visible reaction, to others a dose causing a reaction followed by slight desquamation, and to others a dose causing a reaction followed by marked desquamation or even vesiculation. Another cause of confusion is the fact that the skin and mucous membranes react differently in different parts of the body. The dosage can be measured accurately only by the electroscope and the use of this apparatus is not practical except in scientific laboratories.

The manner in which different tissues respond to the action of radium has been studied and is fairly well understood, but not sufficient attention has been paid to the difference between the erythema and the lethal dose. It is a well-known fact that a lethal dose for some cells will have no effect on certain others. Mucous membrane, except that of the vagina, is much more sensitive to radiation than the skin. Rodent ulcer or basal-cell epithelioma and lympho-

sarcoma are much more easily destroyed than other types of malignant growths. The lethal dose for other types of cancerous growths is from six to seven times greater.

In tumors which do not respond readily to radiation there is more necrosis and less absorption when a lethal dose is given. Thus when sarcoma of the tonsil is treated the growth may disappear before much necrosis develops, whereas, in fibrosarcoma or chondrosarcoma, considerable necrosis may occur before any great amount of absorption takes place.

In infected superficial epidermoid growths the reaction to radium may not be so favorable because the radium inflammation produces oedema of the tissues and may spread the infection. This fact accounts for many radium failures and the belief of some radiologists that infection of a lesion contra-indicates the use of radium.

Metastases in the lymphatic glands cannot be destroyed by an erythema dose. Some radiologists have made the mistake of considering normal cells seven or eight times more resistant than certain cancer cells and more than four times as resistant as the squamous type of cell. This assumption is based on confusion of the erythema dose with the lethal dose and will lead to poor results.

All tissue, whether normal or diseased, is affected by radium and reacts specifically. The lethal dose differs for different types of malignant cells and its determination is further complicated when the growth is situated beneath the skin. Glandular tissue is readily destroyed by the rays. More rays are required to overcome extensive involvement of the lymph glands than involvement of the small glands of the skin, and to destroy hair follicles than to produce a temporary epilation. The submaxillary glands are more resistant than the other glands of the neck. Some involved lymph glands subside readily while others do not. This difference is due probably to malignant and inflammatory processes. Metastatic glands with a large amount of malignant tissue respond to a greater degree than those composed largely of fibrous tissue.

Simple, inflamed, and enlarged glands, Hodgkin's disease, and lymphosarcoma respond readily to a comparatively small amount of radiation. Small tuberculous glands subside more slowly and become quiescent under an erythema dose. Large tuberculous glands seldom disappear entirely. The glands undergo fibrous degeneration with disappearance of the tuberculous foci. By some radiologists the lethal dose for these glands is considered to be about one-third that for carcinoma.

Carcinomatous glands require large doses to destroy all the cancer cells. Smaller doses may cause the glands to become quiescent and undergo fibrous degeneration, but the condition is apt to become active again.

The lethal dose of radium is slightly less than that of the roentgen ray. The dose given should always be the lethal dose. Smaller doses, however, cause degeneration of the malignant cells so that fibrous



change takes place and the rapid spreading of the growth is retarded. The lethal dose destroys the malignant cells for a certain distance and sterilizes at a greater distance, in this way preventing rapid extension and metastasis formation.

Embedding tubes of radium in cancer tissue and using radium needles serve a very useful purpose in that all of the radium rays are rendered effective. Since this method increases the possibility of stimulating the formation of metastases, however, it is well to irradiate the surrounding area previously.

W. L. BROWN.

### LEGAL MEDICINE

**The Rights of Physicians, Associations, and Sanatoriums.** *Harris vs. Thomas et al. (Texas)*, 217 S. W. R., p. 1068.

A physician licensed under the laws of the State of Texas and practicing osteopathy, medicine, and surgery sued for an injunction to restrain a hospital and its staff of physicians and surgeons from further interfering with his practice in that particular hospital. It was alleged in the petition that the plaintiff had no disqualifying charges against him, but that the defendant physicians, in their organized capacity as well as individually, exercised an influence over the hospital and thus deprived him of the benefits to which he was entitled from his practice; also that the resulting damages to him could not be determined definitely and could not be paid for fully in money.

The defendant physicians were organized into a county medical association, and the plaintiff contended that by such an association they were endeavoring to injure, and were injuring, his practice. As the plaintiff was not a member of the medical association, his conclusion was to the effect that the members, by establishing certain rules and regulations, were in effect boycotting him and preventing him from pursuing his profession. He contended that they established an opposition to him. This was completely denied.

The court held that a voluntary association has the power to enact laws governing the admission of members and may prescribe the qualifications necessary for membership. Membership is a privilege which a society may accord or withhold at its pleasure, and courts do not generally interfere with the right of an association to make and enforce its laws and regulations unless they violate the morals or laws of the state. If the association deemed the plaintiff to be an osteopath, and that, as such, he was supporting an exclusive system, the association was within its rights in rejecting him as a member. Its members also had the right to refuse to assist

him in operations. They could, if they deemed it in the interest of medicine or surgery or the welfare of humanity, agree among themselves not to assist him in surgery provided they did so in good faith and with no intent to injure him.

With respect to the hospital, it was held to be the right of the institution to refuse to have business relations with a physician if this seemed proper, and also to adopt such regulations as are proper or deemed by it expedient to improve its efficiency and standards of service. It has a right to standardization and to require of those using its equipment that they possess certain specific medical learning.

For these reasons the injunction asked for was denied.

JOHN A. CASTAGNINO.

**Objection to Physician's Testimony as Privileged Must Be Timely.** *State vs. Powell, Missouri Supreme Court*, 217 S. W. R., p. 35.

In a murder trial a physician was called to testify as to who treated the defendant's injuries. In his testimony he stated that the defendant had cuts on his hands which he, the physician, believed were produced by something which resembled a barbed wire rather than a sharp instrument. No objection was made to this testimony until after it had been given. The objection was not sustained, however, as the court held that it was not made in time and the privilege was therefore waived.

JOHN A. CASTAGNINO.

**Privileged Communications and Waiver—Unethical Practice.** *Bauch vs. Schultz. (N. Y.) 180 N. Y. Supp.*, p. 188.

In this case the plaintiff, who had been injured, was suing to recover damages. The ambulance surgeon who first treated him after the accident was called by the defendant to testify. He and two other physicians from whom the plaintiff received treatment while in the hospital testified to material facts in the treatment without obtaining from the plaintiff a waiver of the right of privileged communications. The court held that such an utter disregard of the ethics of the medical and legal professions could not be passed by without serious condemnation. The relation of physician and patient is peculiarly confidential and is safeguarded by a law in the interest of the patient which forbids disclosures by physicians of material and necessary facts, the knowledge of which was gained in the treatment of the patient by the physician. (Note: This is the rule in New York and some of the other states. It is not the rule in Illinois.)

The court held that the fact that the plaintiff was a free patient did not alter the rule.

JOHN A. CASTAGNINO.

# GYNECOLOGY

## UTERUS

**Heineberg, A.: Uterine Curettage.** *Therap. Gaz.*, 1920, n. s. xxxvi, 538.

The author states that the purpose of this article is to set forth the evils of one of the commonest medical practices, curettage of the uterus. The evidence against the operation began with Emmett and has been increasing to the present day.

Heineberg reviews the changes that occur in the endometrium in the different phases of the menstrual cycle, and explains the various pathologic reports which may be obtained if due regard is not paid to the date of the last menstruation.

The conditions for which curettage is done may be divided into two groups. The first includes dysmenorrhœa, acute antelexion, sterility, and leucorrhœa; the second, menorrhagia, metrorrhagia, and purulent or putrid discharge.

Dysmenorrhœa and antelexion, if relieved at all, are benefited by the dilatation rather than by the curettage. Sterility is due as a rule, not to changes in the endometrium, but to other causes, such as infantile uterus, closed tubes, chronic cervicitis, or some condition in the husband. Kelly has shown that less than 15 per cent of sterile women conceive after curettage. Leucorrhœa is practically always due to disease of the cervix and may be treated without exploring the body of the uterus and subjecting the patient to the danger of infection.

The dangers of curettage in the second group of conditions—conditions due to ovarian hyperfunction, infection, or the retention of the products of conception—have already been so thoroughly discussed that little excuse for the operation remains.

As shown by Polak, the use of the curette is indicated only for the removal of the products of conception before the eighth week and for diagnostic purposes in cases of intermenstrual bleeding at, near, or after the menopause. In all other instances it is not indicated, it is of no value, and it may cause serious injury.

SIDNEY A. CHALFANT.

**Casler, D. B.: A Unique, Diffuse, Uterine Tumor, Really an Adenomyoma, with Stroma But No Glands; Menstruation after Complete Hysterectomy Due to Uterine Mucosa in the Remaining Ovary.** *Surg., Gynec. & Obst.*, 1920, xxxi, 150.

The tumor in the author's case differed from the usual adenomyoma in the fact that it was characterized by an almost total absence of glands in the mucosa, while in the walls of the uterus itself there were no glands whatever, but everywhere large, broad masses of interglandular stroma which infiltrated between the muscle columns and divided

the muscle tissue into a coarse meshwork as far as the peritoneal surface.

Casler describes also a second tumor of the ovary removed at a later operation. This tumor, which he regarded as an ovarian cyst, contained uterine tissue, muscle, glands, and stroma. The stroma resembled that of its prototype in the uterus. The growth was not a teratoma of the ovary, for no other structures were seen.

For four years following the panhysterectomy for the removal of the first tumor the patient menstruated for a part of one day at regular monthly intervals. Death occurred following the second operation.

CARL H. DAVIS.

**Schmitz, H.: Observations on the Technique and Indications of Radium Therapy in Uterine Carcinoma.** *Surg., Gynec. & Obst.*, 1920, xxxi, 177.

There are nearly as many methods of employing radium as there are clinicians using it. The author has tested out the various procedures in his clinic during the past six years, has evolved a safe and efficient technique, and has reached the conclusion that a radium capsule placed in the cervical canal will disperse the rays evenly through the pelvic cavity.

Schmitz insists on the insertion of a retention catheter in the bladder and the flushing of the bowels with castor oil and enemas immediately before the treatment is begun.

The object of radium treatment is to apply the element for a sufficiently long time to destroy the deeply located pathologic processes within the pelvis without causing permanent injury to healthy tissues and organs. Over-dosing leads to such dangerous complications as necrosis and destruction, infection, painful cicatricial formation causing stricture of the rectum, vagina, and ureters, and a systemic reaction which may lead to toxæmia and death.

The author uses 25 mg. of the insoluble sulphate of a chemical purity better than 94 per cent. This is packed in a glass cylinder which is 6 mm. long and has an outer diameter of 2 mm. The glass cylinder is in turn inserted in a silver capsule 0.5 mm. thick and 1.75 cm. in length. Two such capsules are then placed in a brass filter which has walls 0.7 mm. thick and is surrounded by rubber tubing 3 mm. thick. The radium is left in the canal for ten hours and the dose then repeated after from twelve to fourteen hours each day for seven days.

In some cases it is necessary to drain the uterine cavity with a soft rubber T-drain for several weeks.

Three to four weeks after treatment a visible and palpable decrease in the cancer area will be noted.

The author divides his cases into five classes: (1) cases which a physical examination demon-



strates are clearly operable; (2) cases which are doubtfully operable; (3) cases in which an operation is absolutely impossible; (4) advanced cases in which all treatment is hopeless; and (5) cases in which the condition has recurred after a panhysterectomy.

It has been found that when patients in Groups 2 and 3 are treated with radium alone the prognosis is better than when they are subjected to panhysterectomy, excochleation, or cauterization.

Recurrences are very refractory, probably because of the heavy connective-tissue reparative process.

The author has applied radium also directly to metastases in the abdomen but so far has been unsuccessful with this method. MARCUS H. HOBART.

**Polak, J. O.: Total Hysterectomy in Fibroid Tumors of the Uterus; A Plea for This Procedure in Parous Women When Operation Is Necessary.** *J. Am. M. Ass.*, 1920, lxxv, 579.

The author claims that supracervical hysterectomy for fibroid tumors is not the operation of choice in all cases. His follow-up work has shown that the lacerated or infected cervix remains as a constant menace to the woman's health, causing leucorrhœa, metrorrhagia, and backache, and, with its lacerations, eversion, and erosion, paves the way for the occurrence of epithelial cancer in the retained stump. From American literature Polak has collected the records of 256 cases in which cancer occurred in the cervical stump after subtotal hysterectomy for fibroid tumors. These do not include cases in which the cancer made its appearance within one year after the original operation as in such instances it is probable that the disease was present at the time the fibroid was removed.

In the author's experience the postoperative morbidity has been less after the complete hysterectomy than after the subtotal operation, the mortality but  $\frac{1}{2}$  of 1 per cent higher, and the difficulty and time of the operation not any greater. Unless a wide cuff of vaginal mucosa is removed, the vagina is not materially shortened. The technique as given in detail provides for suturing the round ligament to the vaginal vault and the cardinal ligaments to the uterosacrals. This step, with repair of the perineum when indicated, prevents prolapse of the vault of the vagina.

Polak concludes that when it is necessary to operate for fibroid tumor of the uterus in the cases of parous women or those who have had trauma or infection of the cervix, total hysterectomy is the operation of choice. SIDNEY A. CHALFANT.

#### ADNEXAL AND PERI-UTERINE CONDITIONS

**Schochet, S. S.: The Physiology of Ovulation: A Preliminary Report.** *Surg., Gynec. & Obst.*, 1920, xxxi, 148.

The investigations reported were made on the ovaries of the sexually mature hog (*sus scrofa*). The histological examination indicated that the production of the liquor folliculi in the graafian follicle

and the extrusion of the ovum are the same in this animal as in woman and the author believes it is logical to assume that the liquor plays the same role as in human ovulation and that its physiological action in the hog is similar to that in woman.

In the experiments amniotic fluid and fluid from ovarian cysts of the hog were compared with the liquor folliculi and also with fluid from human ovarian cysts. The liquor was obtained under aseptic conditions to avoid any error due to bacterial activity.

The technique used in this experimental work was based on the principles of the Abderhalden dialyzation reaction. Briefly summarized, it consisted of: (1) the preparation of the material to be tested, (2) the process of obtaining the liquor, (3) the preparation of the diffusion tubes, (4) the test, (5) dialyzation, and (6) comparison with controls.

Pieces of muscle and fibrous tissue were boiled in distilled water for three minutes and the filtrate tested for substances reacting with ninhydrin and the biuret reaction. This was repeated until the filtrate failed to give a reaction with 1 ccm. of ninhydrin on being boiled for one minute.

Schlercher and Schull No. 579 dialyzing tubes were used. These were first carefully tested to insure impermeability to albumin. Just before each test they were boiled for five minutes.

In the test small quantities of the liquor folliculi were introduced into the diffusion tubes together with small pieces of muscle, connective tissue, and ovarian tissue prepared as described, separate tubes being used for each test. A layer of xylene was placed upon the fluids in the dialyzer and without to prevent the growth of bacteria and evaporation.

Controls were made with amniotic fluid, normal saline, and cystic fluid in place of the liquor folliculi with exactly the same technique. The period of incubation was twenty-four hours in length and the temperature 38 degrees centigrade. The filtrate or the fluid surrounding the dialyzers was tested with ninhydrin and the biuret test.

The results of these determinations are tabulated as follows:

	Ovarian tissue	Muscle	Connective tissue
Liquor folliculi.....	++++	++	++
Cystic fluid (small cysts in hog)	++	+	+
Amniotic fluid (human).....	-	-	-
Normal saline.....	-	-	-

In experiments in ovarian transplantation small pieces of ovary were transplanted into the anterior chamber of the eye. The experimental animals were albino rats. The transplants were homoplastic grafts. The technique will be described in detail in a later report. In these experiments it was possible to watch the growth of the follicles. In the rat ovulation takes place twenty-four hours after parturition and usually every thirty days.

In one case in which the eye was removed after the follicles ruptured the sections showed free ova

in the anterior chamber and the transplanted ovarian tissue was still viable. Transplantation into the liver and anterior abdominal wall has also been successful. A series of experiments in fertilizing the transplants is being undertaken and, in addition, a series of experiments on intravital staining.

As the work is still incomplete only a few observations are made:

1. Ovulation is due to a specific enzyme which is similar in nature to the enzyme erepsin. Apparently there are also other proteolytic enzymes and a lipase in the liquor folliculi.

2. Atresia of the follicles is due to this proteolytic enzyme or enzymes.

3. These experiments offer a rational explanation for the use of thyroid extract and corpus luteum in sterility.

CARL H. DAVIS.

### MISCELLANEOUS

**Chassot: Peritoneal Menstruation** (Menstruation péritonéale). *Rev. méd. de la Suisse Rom.*, 1920, xl, 453.

Chassot's case of peritoneal menstruation was that of a married woman 25 years of age. The patient had an attack of appendicitis some few years before but was not operated upon. The present illness began with pains in the lower part of the abdomen on the right side. A diagnosis of chronic appendicitis was made and an operation was performed.

When the peritoneum was opened a very large quantity of fluid blood escaped. It then seemed possible that the condition was an extra-uterine pregnancy. The uterus and adnexa were examined therefore but no trace of ovum or placenta was found. The tubes were intact although they were markedly hyperæmic. A ruptured corpus luteum was found in the right ovary from which the blood was oozing. Chassot performed an ovariectomy with peritonization, then extirpated the appendix which was slightly hyperæmic, cleared out the peritoneal cavity which contained about 300 gm. of fresh fluid blood, and closed the abdomen. The patient made a good recovery.

Examination of the extirpated ovary revealed no evidence of an ovarian pregnancy. The corpus luteum was that of a normal menstruation.

In the literature the author has been able to find only a few cases of peritoneal hæmorrhages occurring from a menstruation, but in one such case reported the woman was almost exsanguinated when the laparotomy was performed.

Examination of the appendix in the author's case showed that there was some peri-appendicitis.

Chassot does not enter into a discussion of the causes of hyperæmia of the genital organs but states that in the case reported the patient's general blood plethora might have been the etiological factor, the hæmorrhage being of the nature of that which occurs in epistaxis. WILLIAM A. BRENNAN.

**Mueller, M.: Genital Tuberculosis in the Female from the Modern Viewpoint Regarding Tuberculosis, and the Question of Ovarian Tuberculosis and Primary Abdominal Pregnancy** (Die Genitaltuberkulose des Weibes im Rahmen der modernen Tuberkuloseforschung, zugleich ein Beitrag zur Frage der Ovarialtuberkulose und der primären Bauchhöhlenschwangerschaft). *Arch. f. Gynaek.*, 1920, cxii, 317.

Tuberculosis of the female genital organs is found in from 1 to 2 per cent of autopsies. Primary genital tuberculosis, however, is very rare, the infection being usually borne to the genitals by the blood stream or through the lymphatics from contiguous or neighboring organs. A primary genital tuberculosis develops only when immunity is not established during childhood. In such cases the course of the condition is so rapid and is associated with such marked pelvic and peritoneal symptoms that its true nature is obscured.

In the female genital organs three types of tuberculosis are found: a miliary, a fibrous or interstitial, and an ulcerating type. When the tubes are involved a marked exudative, catarrhal inflammation may be set up. In such cases the pathologic changes may be very minute and the number of bacilli very large. There is both an acute and a chronic form of tubal tuberculosis. In the acute form the mucosa is early destroyed, the wall of the tube becomes thickened, and the abdominal end of the tube remains open until the extruded bacilli set up a local peritonitis which closes it. The chronic form closes the abdominal ostium early and causes the formation of a pyosalpinx with seropurulent or thin cheesy fluid.

The histories of two interesting cases of genital tuberculosis are given. FRANGENHEIM (Z).

**Stephen, S.: The X-Ray Treatment of Peritoneal and Genital Tuberculosis in the Female** (Zur Roentgenbestrahlung der Bauchfell- und Genitaltuberkulose des Weibes). *Strahlentherapie*, 1920, x, 957.

The author describes the combined surgical and X-ray treatment of peritoneal and genital tuberculosis used at the Greifswald Gynecological Clinic. The more easily accessible tube is removed but the ovary is left. In the X-ray treatment the side not operated upon is exposed and the disease focus placed under cross fire. If both tubes are easily accessible only the tube most severely involved is removed and the other one is rayed. Menstruation is therefore not affected.

The treatment is given through the back and through the abdomen. In pelvic and sacral raying the side operated upon is exposed. The raying is continued to four full series, the total dosage being 4,680 X. Menstruation is not influenced even by the maximal dosage. In addition an attempt is made, apparently with success, to improve the patient's general condition with the use of the ultra-violet rays and the Solluk lamp.



Six cases of peritoneal and genital tuberculosis have been considerably improved. Four other patients have died of intercurrent disease. The increase in body-weight in the cases in which improvement has been obtained ranged from 2 to 26 pounds.

A. ZIMMERMANN (Z).

**Gellhorn, G.: The Reactions of Syphilis in Women.** *Am. J. Syphilis*, 1920, iv, 480.

Manifestations of syphilis differ in the two sexes. It is more difficult to demonstrate the initial lesion in women because of the complexity of the female genitalia which offers more chance for concealment of the chancre. In the female the initial lesion is apt to be smaller and less frequently indurated, and tends to clear up more rapidly than in the male.

The secondaries are usually more fleeting in women. Because of the absence of irritation from smoking, mouth lesions are not as apt to be as prominent as in men. Fever and anæmia, however, are more common than in men, and obscure cachexia should suggest syphilis.

Although tabes and paresis are relatively infrequent in women, symptoms of neurosyphilis may often be obscured by a superficial assumption of genital or climacteric ailments.

Attention is called to the frequency of lesions of the internal genitalia and the importance of determining before operation that an old cervical erosion is not a syphilitic manifestation. The similarities of gummata of the cervix and cancer also must be borne in mind. The author cites two cases incorrectly diagnosed as inoperable cancer which cleared up under antisyphilitic treatment. Cancerous lesions may begin on the basis of former syphilitic lesions.

The rôle of syphilis in obstetrics has been well studied. In the wake of syphilis, miscarriage, stillbirth, and congenital syphilis frequently follow. Great responsibility devolves upon the obstetrician for the diagnosis and treatment of syphilis and for prenatal care.

Syphilis in women is an important factor in social medicine from the standpoint of marriage and prostitution.

"The symposium has emphasized these factors: that insiduously and in a thousand disguises syphilis may occur in all classes and categories of human pathology; that the aid of the laboratory is of the greatest and inestimable value in combating the disease; but that our diagnosis and treatment should be based first and foremost upon clinical study and observation of the syphilitic individual."

RAE T. LA VAKE.

**Culbertson, C.: The Management of General Pelvic Peritonitis.** *Surg. Clin. Chicago*, 1920, iv, 675.

During the acute stage of general pelvic peritonitis the patient should be put to bed and kept quiet. After the condition has remained afebrile for three weeks, and the acute pathologic process has subsided, operation is safer and the extirpation of

diseased tissues, if necessary, may become less radical. In rare instances the process may clear up entirely and an operation will not be needed.

The persistence of fever, or fever associated with chills, after a few days of rest in bed and quiet indicates that an abscess is developing or has developed. In such cases and when the posterior cul-de-sac is filled with a fluctuant mass, drainage should be established by a T-shaped posterior colpotomy. This Culbertson did in the case presented before the clinic.

Under light gas-oxygen anæsthesia the cervix was exposed, grasped with volsella, and pulled into view. The incision was made  $\frac{5}{8}$  in. above and directly behind it and made T-shaped by splitting the vaginal wall posteriorly. Under the guidance of the finger, the distended tubes were opened with closed 8-in. curved forceps. A strip of gutta-percha was placed loosely in the cul-de-sac and vagina. The volsella were then removed, the cervix was allowed to drop back, and the patient put to bed. The drain was removed in twenty-four hours.

One month later the laparotomy was done. When the abdomen was opened it was found that the distal end of the ileum and the edge of the omentum were densely adherent across the lower portion. After the adhesions had been freed the walls of the ileum were found to be infiltrated and raw, but not perforated. The omentum and ileum were therefore pushed back beneath the laparotomy pack. The anterior cul-de-sac was obliterated by adhesions between the uterus and bladder. The diseased appendages and ligaments filled the pelvis laterally and posteriorly and the extensive infiltration invaded the rectum. The sigmoid was free but unusually short. The left ovary was three times its normal size and, with its tube, formed a common abscess. The right ovary was slightly enlarged, soft, and œdematous, but could be freed.

Culbertson prefers a bilateral pyosalpingectomy with defundation of the uterus in the treatment of such conditions in young women as this operation preserves menstruation. In the case reported, however, he believed it best to amputate at, or below, the internal os because of the metritic condition and extensive infiltration of the ligaments. After freeing the bladder, he removed the tubes, the left ovary, and the corpus uteri *en masse* and destroyed the remaining cervical mucous membrane with the cautery at white heat. The latter step is very important in preventing subsequent leucorrhœa which sometimes is very troublesome.

The raw edges of the cervical stump were sutured together with the free ends of the round ligaments inserted between them and securely fastened by through-and-through sutures of heavy iodine catgut. Care was taken to undersew the last ligatures at the bottom of the broad ligament in order to guard against postoperative hæmorrhage.

Considerable stress was laid upon the necessity for peritonizing all raw areas in the abdomen. In clean cases this is easy, but when great destruction

of the peritoneum has occurred it is difficult. In the case reported the raw surface was extensive and the sigmoid short, but fortunately the cæcum was long and mobile.

Beginning at the reflection of the sigmoid from the pelvis the former was stitched by continuous suture to the left side of the pelvis over the round ligament and bladder to about the midline so that it covered all raw areas on this side. When possible the fat tabs of the appendices epiploicæ were used and therefore few stitches entered the gut wall. After the removal of the appendix the mobilized cæcum was stitched similarly to the right side so that it met the sigmoid in the middle. The sigmoid and cæcum were then stitched together across the middle anteroposteriorly, and separately posteriorly to the rectum or pelvic wall. In this manner all raw areas of the pelvis were effectively closed off from the abdominal cavity.

The lower raw end of the ileum was covered with a strip of omentum  $3\frac{1}{2}$  in. wide across its lower end. The abdomen was closed without drainage.

The patient left the hospital on the twentieth day in good condition.

R. E. CHRISTIE.

**Dietrich, H. A.:** *The Results Obtained with Mesothorium and Radium in the Treatment of Carcinoma of the Genital Organs at the Goettingen University Gynecological Clinic* (Erfolge der Mesothorium- und Radiumtherapie des Genitalcarcinoms an der Goettinger Universitaets-Frauenklinik). *Strahlentherapie*, 1920, x, 854.

This article is based on the results obtained in 109 cases—62 new cases, 9 cases of recurrence following operation, and 38 cases given prophylactic radiation following operation—which were treated during the period from 1913 to 1917. Whenever possible the radio-active substance was introduced into the cervix or into the tumor itself.

Of 9 cases treated by radiation alone, 55 per cent were cured. The Wertheim operation gave a cure

lasting over two years in only 25 per cent of the cases. Of 36 inoperable cases of carcinoma of the cervix, 11.1 per cent were cured. All of the cases in which the parametrium was involved as far as the pelvic wall were fatal although at first considerable improvement was noted. Three cases of carcinoma of the fundus which were operable and 1 which was inoperable improved very much at first but the end-result was poor. Three of these patients died and the other was lost sight of.

The results of prophylactic radiation after vaginal extirpation were good. Of 3 patients so treated 2 remained well for more than four and a half years and 1 for more than three years. Five cases of vaginal carcinoma were fatal although at first they showed improvement. Of 6 patients with carcinoma of the vulva, 1 who had a recurrence following operation remained well after fourteen years, 3 died, and 1 suffered a burn from overdosage. Of 3 cases given prophylactic radiation 2 remained cured for more than three years. Of 2 patients with carcinoma of the urethra 1 remained well longer than four years.

In 9 cases of recurrence following vaginal or abdominal extirpation of the uterus and in cases in which metastases of an ovarian carcinoma developed in the cervix the results were poor, the complications consisting of extensive necrosis in 1 case, vesicovaginal fistula in 3, rectovaginal fistula in 4, radium ulcer of the vagina in 3, and radium ulcer of the rectum in 2. Persistent tenesmus and discharges of mucus and blood were often observed. There were also general systemic disturbances but these were not severe.

The author comes to the conclusion that genital carcinoma must be treated with radium early, and at least 50 mg. of the radium element must be used. The minimal dosage should be 8,000 milligram hours. For deep therapy a combination of radium and intensive X-ray treatment is essential.

W. V. SIMON (Z).



## OBSTETRICS

### PREGNANCY AND ITS COMPLICATIONS

**Elliott, I. H.:** *Pregnancy and Tuberculosis. Canadian Pract. & Rev.*, 1920, xlv, 263.

After a general discussion the author gives the following summary and conclusions:

1. Tuberculosis of the lung exerts practically no influence against conception.

2. It seems to exert little influence on the course of pregnancy and unless the patient is in a far-advanced stage of the disease has little or no tendency to cause abortion, miscarriage, or premature labor.

3. Pregnancy may prove a dangerous complication in tuberculosis of the lung, especially if the disease is active.

4. A woman with active tuberculosis of the lung should not marry.

5. A tuberculous woman should not become pregnant unless the lesion is limited and its active signs have been absent for a period of at least two years.

6. There are no rules by which it may be determined with certainty which case of tuberculosis will bear the added strain of pregnancy well and which will not. It is equally difficult to determine in what cases abortion will improve the future prospect of the pregnant woman. The treatment must be adapted to the requirements of the particular case.

7. Intervention after the fifth month of pregnancy rarely gives satisfactory results. Prior to the fourth month it is possible that the mother's future may be improved by emptying the uterus by the modern operation of vaginal hysterotomy under gas and ether anæsthesia. By this procedure the shock incident to a prolonged operation, ordinary anæsthesia, and loss of blood is avoided.

8. Labor should be made as easy as possible. The induction of premature labor two weeks before term may be advisable.

9. The tuberculous mother should not be allowed to nurse her child.

10. The ordinary hygienic and dietetic treatment of tuberculosis must be strictly observed during pregnancy and the puerperium for at least six weeks after all evidence of pulmonary activity has subsided. The obstetrician and the internist should work in the closest coöperation.

11. A pregnant woman giving a history at all suggestive of pulmonary tuberculosis should be subjected to a thorough examination by a competent internist at the earliest possible date. Only in this way can the proper treatment be instituted at the time when it is most valuable.

CARL H. DAVIS.

**Wallis, R. L. M.:** *The Demonstration on the Diastase Content of the Urine in the Toxæmias of Pregnancy. Brit. M. J.*, 1920, ii, 273.

Although the presence of a starch-splitting enzyme in the urine has been known for a long time, it received new interest when, in 1909, Wohlgemuth published his method of determining it and showed that the amount of diastase is increased in pancreatic disease. Wohlgemuth's findings regarding pancreatic disease have been confirmed by a number of observers, but the best and most complete work is that of Corbett. Corbett showed that a certain amount of diastase is normally present in the blood, and that the same quantity is excreted by the kidneys. The slightest damage to the renal epithelium leads to an increase or decrease of diastase in the urine, depending on the permeability of the kidney. Wohlgemuth and Noguchi found an increase of this substance in both blood and urine concurrent with injury to the pancreas.

In making his estimations the author uses Wohlgemuth's technique. Ten test tubes containing respectively 1, 0.5, 0.2, 0.1, 0.08, 0.06, 0.04, 0.02, 0.01 and 0.008 ccm. of urine from a twenty-four hour specimen, freshly collected or preserved in toluol, are placed in a water bath at 39 degrees centigrade. Two cubic centimeters of 0.1 per cent starch solution in 0.5 per cent solution of sodium chloride are then added, and the mixture is stirred and allowed to stand for thirty minutes. At the end of that time it is cooled under tap water and two drops of a 1:50 normal iodine solution are added to each tube. The appearance of a golden yellow color indicates complete digestion of starch; a red color, digestion to the dextrin stage; and a violet color, that free starch is present. The diastase in the urine is given in units. For example, if the red color, which is considered the limit test, is shown in the tube containing 0.1 ccm. of urine which has digested 2 ccm. of starch solution, the 1 ccm. of urine would digest 20 ccm. Expressed in diastase content, this is equal to 20 units. The normal value for healthy persons varies from 10 to 33 units and the average value is 16 units.

The procedure adopted by the Maternity Department of St. Bartholomew's Hospital is as follows:

A catheterized specimen of urine is examined for albumin, casts, and diastase content; analyses of the blood are made for urea, non-protein nitrogen, sugar, etc., and analyses of the cerebrospinal fluid for urea; McLean's urea concentration test is done; and a complete urinalysis on a standard diet is obtained.

In normal pregnancies albumin and casts are absent, the diastase content of the urine is normal, the blood urea varies from 0.02 to 0.05 per cent, and

the blood sugar is normal except in the glycosuria of pregnancy. The urea concentration test was found to be 2 per cent of urea or more.

In the toxæmias of pregnancy the chief feature is the high diastase content. Except in pancreatic diseases, these are the only conditions in which it is found. In true toxæmia no evidence of pancreatic involvement has been demonstrated and the blood analysis remains negative. In the neurotic vomiting of pregnancy the diastase content is normal. The vomiting leads to the production and elimination of acetone bodies and a high ammonia coefficient.

The most striking difference is noted in nephritis complicating pregnancy. In this condition the urine contains albumin and casts and a diastase content below 10 units, and the blood urea is increased. The urea concentration test is of value as a means of ascertaining the degree of mechanical damage to the kidney, but on account of the danger of increasing the excess of urea already present in the blood and body fluids this is never made without a previous blood-urea estimation.

Wallis' conclusions are based on twelve cases of toxæmia and fifteen cases of nephritis in pregnancy, a large number of cases with other complications and normal cases. The observations show that all convulsions are not eclamptic; some may be uræmic. In the two conditions the treatment is different. In the true toxæmic vomiting and pre-eclamptic albuminuria of pregnancy treatment along the lines of neutralizing the toxins circulating in the blood is being pursued. The diastase ferment test is a means of recognizing this condition and preventing its sequelæ. During the past eighteen months the mortality from the toxæmia and nephritis of pregnancy has fallen to nil.

MERLE R. HOON.

**Cocke, N. P., and Mason, J. M.: The Management of Acute Appendicitis Developing in the Latter Weeks of Pregnancy: Report of a Case Treated by Cæsarean Section and Appendectomy.** *J. Am. M. Ass.*, 1920, lxxv, 95.

In cases of appendicitis developing in the latter weeks of pregnancy it is inevitable that some time is lost in deciding whether the pain is due to the onset of labor or an extra-uterine cause. Conditions to be excluded are hæmatogenous infections of the kidney, pyelitis, ureteral obstruction, gall-bladder disease, and inflammatory affections of the appendages.

Repeated observations must be made of the pulse rate, the temperature, and the leucocyte count. Any tendency whatever on the part of the patient to refer the pain to the right iliac fossa or the elicitation of tenderness or rigidity in this region must be given special weight in view of the fact that these signs are frequently obscured by the increased size of the uterus.

When a diagnosis of appendicitis is made, operation is indicated. In some instances the operation must be exploratory in character and undertaken on the ground that in cases of severe and persistent

abdominal pain which is not relieved by the usual remedies operative investigation is the safest procedure.

As at this late period the life of the child is not endangered by terminating the pregnancy the authors believe this procedure is indicated. Cragin and Williams do not favor the emptying of the uterus from above or below in dealing with the appendix. As to whether the emptying of the uterus should be done before or after the appendix is removed the authors state that it is better to terminate the labor first and remove the appendix immediately thereafter. It is generally agreed that the removal of an appendix in the presence of a full-term uterus is usually very difficult. Furthermore, if the insertion of a drain is necessary, the subsequent change in intra-abdominal relations brought about by the uterine contractions and the diminution in size of the uterus after delivery may so disturb the operative field as to cause the spread of infection to all parts of the abdomen. The maintenance of a quiescent condition, on the other hand, would allow the formation of protective adhesions and subsidence in the intraperitoneal inflammation. With the uterus empty and contracted the appendix may be located and removed with greater ease and there is little danger of interference with the peritoneal toilet after the operation is completed.

The method used to terminate the pregnancy must be rapid and certain. While a slowly induced labor is in progress suppurative and peritonitis may be progressing much more rapidly. If the patient is a multipara accouchement forcé may be considered if the obstetrician is sure that he can effect delivery promptly by this method. If the patient is a primipara or if there is any doubt regarding immediate delivery in the case of a multipara, cæsarean section with appendectomy should be performed.

The authors are definitely opposed to the teaching that operation in the latter months of pregnancy should be reserved for cases in which there is perforation or suppuration. The woman at this period should be given the same chance for recovery that is offered the woman who develops appendicitis in the earlier months, namely, early diagnosis and prompt removal of the appendix before perforation, gangrene, or peritonitis has developed.

CARL H. DAVIS.

## LABOR AND ITS COMPLICATIONS

**Barnes, A. R.: Twilight Sleep; A Report of 30 Cases and a Summary of 5,575 Cases Reported in the Literature.** *J. Indiana State M. Ass.*, 1920, xiii, 259.

In the cases reported in the literature from 1/6 to 1/4 gr. of morphine was given and was not repeated. The first dose of scopolamine averaged 1/150 gr. Following this, the dosage was varied from 1/150 to 1/450 gr. according to the requirements of the particular case.



The author gives 1/6 gr. of morphine and 1/133 gr. of hyoscine hydrobromide. The morphine is not repeated.

It is generally believed that the injections should be begun when the pains have become strong and regular and there is two fingers' dilation of the cervix. The author begins the narcosis when strong regular pains come on at five-minute intervals in the cases of primiparæ, and at ten-minute intervals in the cases of multiparæ.

There is danger of asphyxiation of the child if the morphine is given within two and one-half or three hours of delivery.

The patient should be put into a quiet darkened room and her ears plugged with cotton. No conversation above a whisper should be allowed. It is advisable, in addition, to cover the eyes with light gauze.

To determine the degree of narcosis Gauss and Beach recommend the memory test but this has been found unreliable by most obstetricians. The co-ordination test of placing the finger to the nose is also not infallible as in some of the author's cases amnesia was obtained without loss of co-ordination.

In the cases of 1,179 primiparæ reported in the literature the average number of injections necessary was 6, while in those of 1,256 multiparæ it was 3.2. In the author's cases the corresponding average for 20 primiparæ was 4.8, and for 10 multiparæ, 4.6.

In the author's cases the duration of the first stage of labor was unaffected but the second stage was prolonged from one to four hours in the cases of primiparæ and slightly prolonged in the cases of multiparæ.

Mild restraint was required in 6.6 per cent of the author's cases.

Forceps were applied in 412 of 2,442 cases reported in the literature (16.8 per cent) and in 46 per cent of the author's cases.

In 5,205 cases reported in the literature the respiration of the child at birth was spontaneous in 4,053 cases (77.8 per cent). Light asphyxia was present in 16.9 per cent, and deep asphyxia in 0.87 per cent. The still-births in 4,812 cases numbered 244 (4.4 per cent). In the author's series 5 babies were born in oligopnœa and there was one still-birth in a case of contracted pelvis after thirty-six hours of labor. In the latter case no heart tones were heard twelve hours before delivery.

In the author's series there was 1 case of severe postpartum hæmorrhage.

In 2,395 cases reported in the literature amnesia was complete in 1,744 (72.8 per cent), partial in 14.9 per cent, and absent in 5.7 per cent. In the author's series amnesia was complete in 50 per cent, partial in 40 per cent, and absent in 10 per cent.

In the author's series the average duration of labor was 19.5 hours in the cases of primiparæ and 11.3 hours in the cases of multiparæ.

All writers agree that the method is safe for the mother. There were no maternal deaths in the author's series.

Successful twilight sleep demands constant supervision on the part of the obstetrician. The most important point to be borne in mind is that the morphine should not be administered later than three hours before delivery. The dosage must be regulated according to the patient's reaction and co-ordination tests. If the pains subside, from 2 to 4 m. of pituitrin will restore their vigor and frequency.

Twilight sleep is unsuitable in emergency conditions such as eclampsia, placenta prævia, or any condition precluding a natural birth. The author believes it ideal in borderline cases of pelvic contraction when it is desirable to give a test of labor. The method increases forceps operations from 8 to 10 per cent.

HAROLD K. GIBSON.

**Zarate, E.: Subcutaneous Symphysiotomy in Argentina** (*La sinfisiotomia subcutanea en la Argentina*). *Semana méd.*, 1920, xxvii, 449.

In the technique employed by Zarate the index and middle fingers of the left hand are introduced into the vagina in order to push back the urethra to the right side. The clitoris is then displaced downward to the arch of the arcuate ligament with the thumb of the same hand. With a double-edged bistoury, about 6 cm. long, the central point of the symphysis is perforated from above downward. The cutting edge of the bistoury is then carried downward to the arcuate ligament, which is protected by the thumb of the left hand, and the other half of the fibrocartilage is sectioned to the upper border. Assistants then gradually increase the abduction of the legs already flexed upon the abdomen until tension is placed upon the fibers of the arcuate ligament. The bistoury, still inserted, is then brought down upon these fibers and, if necessary, they are gradually sectioned. Slight hæmorrhage is controlled by compression with the fingers and thumb in the gap thus formed.

After the operative procedure the patient is given an injection of 1 cg. of pituitrin. Uterine contractions sufficient to bring about the engagement of the head usually begin within ten minutes and delivery is easily accomplished with the aid of Kristellar pressure.

Accidents and complications of the procedure are discussed as immediate and consecutive or late. Among immediate accidents are hæmorrhage, hæmatoma, wounding of the vagina, urethra, or bladder, and shock. Hæmorrhage may be controlled as a rule by pressure as already indicated. Wounds of the bladder, urethra, and vagina are exceptional and due usually to a defect in the technique.

Among consecutive complications are œdema of the labia majora, thrombophlebitis, and suppuration of the symphysis, all of which are rare. Still more rare are urinary incontinence and difficult micturition.

Franck's method is especially apt to produce lesions of the corpus cavernosum of the clitoris resulting in the formation of hæmatomata in about



30 per cent of cases and often followed by thrombophlebitis. The author's modification of Franck's method obviates this danger as well as that of the other accidents mentioned. The sectioning of at least a number of the fibers of the arcuate ligament is regarded as essential for adequate separation, contrary to the teachings of Leopold and Koehrer.

Subcutaneous symphysiotomy stands midway between artificial premature delivery and cesárean section. In some cases it may be combined with the former to save the life of the child. It is indicated absolutely in osseous dystocia if the conjugate is below 8 cm. The indications do not depend entirely upon the conjugate, however, as the pelvis as a whole must be taken into consideration. In certain types of deformity, such as funnel-shaped pelvis, just-minor pelvis, and sacrococcygeal ankylosis, the operation may be performed without strict regard for the conjugate. Relative indications include generally the same conditions as those for forceps and version.

WILLIAM R. MEEKER.

#### PUERPERIUM AND ITS COMPLICATIONS

**Bonney, V.: An Introductory Paper on the Prevention and Treatment of Puerperal Sepsis.**  
*Brit. M. J.*, 1920, ii, 263.

The solution of the problem of preventing and curing septic infection of the puerperal uterus requires the determination of: (1) the original source of the organism, (2) the mode of its entrance into the uterus, and (3) its exact situation by the time it has produced symptoms of sepsis.

In nearly all cases of severe sepsis the streptococcus, either alone or in conjunction with *bacillus coli communis*, is the predominating bacterium. The infection may be either autogenous or heterogenous. Extrinsic sources of infection probably account for the epidemics of puerperal sepsis which have occurred periodically in lying-in hospitals. This difficulty has been overcome to a large extent by antiseptic midwifery. The carrying of bacteria, such as the streptococcus of high virulence, a delicate organism which dies rapidly in the open air, is not common in present-day practice.

Although epidemics of puerperal sepsis such as occurred in the past are now rare, the yearly mortality due to the disease shows a very unsatisfactory degree of diminution as compared with the results obtained by antiseptic surgery. In addition to the fatalities, many patients who ultimately recover are seriously ill and there are many cases of fever due to minor degrees of sepsis. The fact that this condition persists in spite of present-day antiseptics suggests an affirmative answer to the question as to whether or not organisms capable of producing puerperal sepsis commonly pre-exist in the body. The organisms which are pathogenic in puerperal sepsis may be isolated constantly from the lower bowel. The streptococcus *faecalis* is mentioned as the causative agent in appendicitis, pelvic inflammation, and puerperal and abortional

sepsis. Although this organism is found in only a certain number of the cases of puerperal sepsis, other types of streptococci found in a septic uterus may be isolated from the bowel. Moreover, septic foci in the teeth, mouth, or throat, an unsuspected suppurating appendix continually discharging into the cæcum, catarrhal patches on the colic mucosa, or a chronically inflamed pile may be sources of infection producing virulent puerperal sepsis.

In the author's opinion too little attention has been paid to preventing the entrance of intestinal bacteria into the uterus and too much attention is given to the prevention of the entrance of extrinsic organisms. Great technical care should be used in isolating the anal area as far as possible from the field of operation during obstetrical procedures. A 1 per cent solution of equal parts of crystal violet and brilliant green in half and half alcohol and water is recommended as an antiseptic for sterilizing the vagina and the surrounding parts.

It is obvious that organisms may be introduced into the uterus by the hands and instruments, especially during intra-uterine manipulation. In the larger number of cases of puerperal sepsis, however, intravaginal or intra-uterine manipulation has not taken place. Therefore, certain organisms transplanted into, or originally present in the vagina must be transported into the uterus in some way subsequent to labor. The experimental work of Bond seems to indicate the presence of an ascending current along the surface of the vaginal, cervical, and uterine canals. Another possible route of infection is transperitoneal transmission of the organisms.

The exact situation of the infecting agents by the time the symptoms of sepsis are produced is important as regards treatment. Unlike septic abortions, puerperal sepsis is not usually associated with retention of gross fragments of placental tissue in the uterus. Taking all cases into consideration, sepsis occurs as commonly when the uterus is completely emptied as when it is incompletely emptied. The organisms are situated in the uterine wall almost from the beginning of the infection and shortly afterward attain a deeper position. The commonest route of infection is by way of the ovarian veins. The phlebitis set up is often accompanied by a lymphangitis which affects the tracts of connective tissue surrounding the ovarian vessels in the upper parts of the broad and ovarian ligaments. Extension along the tubes is rare after full-time delivery. Ovarian abscess is more common because of a lymphatic drainage. Active peritonitis is unusual but when it does occur is generally localized around an ovary or tube. Passive peritoneal infection is present in a large proportion of the fatal cases.

It has been suggested that the methods of treating infected war wounds might be applicable in the treatment of the infected uterus. Immediate sterilization, progressive sterilization, and immediate excision have each been considered. The first might



be applied immediately following delivery to patients in whom infection is known or highly suspected. It would be useless, however, after the appearance of symptoms. Progressive sterilization would necessitate early treatment and many unnecessary intra-uterine operations. Excision would mean the performance of a hysterectomy at the end of every confinement in which infection was a possibility. No surety of defeating the cause of puerperal sepsis by the newer surgical methods is offered in the three procedures mentioned.

Bonney is frankly pessimistic as to the value of vaccines, but is of open mind as to the future progress in this form of therapy. Of the methods of treatment directed toward preventing the bacteria or their toxins from reaching the general circulation, ligation of the ovarian vessels and lymphatics which accompany them offers the best results. Bonney has performed this operation most often in cases of post-abortion sepsis in which a definite thickening could be felt in the line of the ovario-uterine and ovario-pelvic ligaments. The whole tract from the side of the uterus up to the highest accessible point in the line of the ovarian vessels is generally removed. The possibility of extending this procedure to cases in which no definite thickening can be found in the presence of the other symptoms seems rational. Prevention is more to be relied on than cure. While the finding of the true antidote for puerperal sepsis is doubtless reserved for some laboratory worker of the future, prevention is in the hands of every obstetrician.

W. N. ROWLEY.

#### MISCELLANEOUS

**Williams, J. W.: The Significance of Syphilis in Prenatal Care and in the Causation of Foetal Death.** *N. York State J. M.*, 1920, xx, 252.

The author's investigation was begun in April, 1916, and this paper is based upon a critical study of 302 foetal deaths occurring in 4,000 consecutive deliveries between that period and December 31, 1919. In every instance an effort was made to elicit a possible history of syphilitic infection. To detect the presence of the clinical signs of the disease a Wassermann test was made at the patient's first visit, and if the result was positive, proper treatment was given in the syphilis clinic if sufficient time was available before delivery. At the conclusion of labor a Wassermann test was carried out on the foetal blood obtained from the maternal end of the umbilical cord. Every placenta was preserved and examined histologically, and if the child was born dead or died after delivery, every effort was made to obtain an autopsy in order to determine the cause of death accurately, particular attention being given to the recognition of syphilitic lesions and the demonstration of the presence of spirochætes.

Of the 4,000 patients, 1,839 were white women and 2,161 negroes. The incidence of positive Wassermanns in the two classes was as 2.48 is to 16.29 per

cent. Therefore 1 in every 40 white women and 1 in every 6 colored women gave a positive reaction. It should be borne in mind, however, that this incidence does not exhaust the possibilities of syphilis as there were 105 additional women in the series whose Wassermann reactions were negative, but in whose histories some mention was made of syphilis. Forty-four of these women had presented a positive Wassermann in a previous pregnancy, but later gave a negative test following efficient treatment, with the result that the present pregnancy ended in the birth of a normal child. On the other hand, in the remaining 61 cases autopsy revealed the characteristic lesions and the presence of spirochætes in the foetal tissues, the living child presented clinical evidence of hereditary syphilis, or the placenta showed characteristic syphilitic lesions.

Two hundred and twelve of the 302 dead babies came to autopsy. These included not only infants dying at the time of labor or during the two weeks immediately following it, but also those dying during pregnancy from the time of viability onward; namely, children weighing between 1,500 and 2,500 gm. or measuring between 35 and 45 cm. in length. Of the 302 deaths, 99 were those of white children and 203 those of negroes, an incidence of 5.4 and 9.4 per cent respectively. One hundred and fifty-seven deaths occurred at the time of labor or during the first two weeks of the puerperium, and 145 before term.

Syphilis was noted in 104 cases, in 89 of which the diagnosis was confirmed by autopsy with the demonstration of spirochætes in the foetal tissues. In the remainder the diagnosis was made from the presence of syphilitic lesions in the placenta and a positive Wassermann test on the part of the mother. The causes of death were as follows:

	Cases	Per cent
Syphilis .....	104	34.44
Dystocia .....	46	15.20
Prematurity .....	32	10.59
Toxæmia .....	35	11.55
Cause unknown .....	26	8.61
Placenta prævia and premature labor ..	..	....
Separation .....	16	5.28
Deformities .....	11	3.64
All other causes .....	32	10.69
	302	100.00

The cause of death was determined from the autopsy findings, and when such findings were not available, by a careful study of the clinical history of the case. Thus, in 89 of the 104 syphilitic cases the diagnosis was made at autopsy, while in the remaining 15 it was based upon clinical findings in the child, or the presence of syphilitic lesions in the placenta associated with a positive maternal Wassermann.

Syphilitic patients may be divided into three groups: (1) those who have had no treatment; (2) those who have had inefficient treatment consisting of from 4 to 6 injections of salvarsan and no after-treatment; and (3) those who have had satisfactory





# GENITO-URINARY SURGERY

## ADRENAL, KIDNEY, AND URETER

**Lett, H.: Renal Calculus.** *Practitioner*, 1920, cv, 81

The real danger of a renal calculus lies in its complications — hydronephrosis, pyonephrosis, perinephritic abscess, pyelonephritis, interstitial nephritis.

In discussing the classical symptoms Lett emphasizes the fact that they may not develop for a long time and then may appear on the opposite side. In his opinion colic followed by hæmaturia suggests calculus, while hæmaturia followed by colic may often be due to a malignant growth. He has seen cases of calculus mistaken for acute intestinal obstruction, ruptured ectopic pregnancy, and acute appendicitis. The dull pain of calculus between acute attacks of colic has often been attributed to chronic appendicitis.

To prevent recurrence the treatment given following the operative removal of a renal calculus is very important. The patient should not be allowed alcohol or acids, and should be given urinary antiseptics and large quantities of fluids.

In 50 consecutive operations for renal calculus reported by Lett there were 2 deaths, one that of a patient with anuria and the other that of a woman of 58 who suffered an acute exacerbation of a former colitis.

Lett believes the recent improvement in the results of operations of this type is due chiefly to the accurate study of what was until recently the unknown factor in the equation, i.e., the efficiency of the opposite kidney. HENRY L. SANFORD.

**Braasch, W. F.: Conditions Contra-Indicating Operation with Stone in the Kidney and Ureter.** *Minnesota Med.*, 1920, iii, 387.

Several circumstances should be considered before an operation is recommended for stone in the kidney and ureter. As it is generally acknowledged that 75 per cent of stones pass within three or four months after the onset of the first symptoms, operation should be delayed for at least this length of time and perhaps for six months. An exception may be made, however, in cases of excessive pain, evidence of acute cortical or perinephritic infection, urinary retention sufficient to endanger the kidney, or stones too large to pass.

When the roentgenogram shows that the stone is less than 2 cm. in diameter, operation should be delayed in the hope that the calculus will pass spontaneously. A stone of this size may be difficult to locate in the kidney substance and search may cause much damage. If the symptoms are indefinite and identification of the shadow is uncertain, immediate operation should not be considered.

The urgency of operation may not be so great when the stone is located in the cortex or the end of the calyces as in these locations it may cause little damage to the kidney substance and will produce fewer symptoms than if it were located in the pelvis. X-ray examinations made at intervals which show a change in the position of the ureters are indicative of early passage. When the stone is situated in the bladder portion or projects into the bladder operation is rarely indicated.

Multiple stones usually indicate the necessity for surgical interference on account of increased damage to the kidney substance. If one stone is lodged in the ureter and another in the kidney pelvis, the former should be removed and time should be allowed for the spontaneous passage of the latter if it is less than 2 cm. in diameter.

Clinical or laboratory evidence of low kidney function is usually a contra-indication to operation. When the symptoms are very acute, however, operation may be justifiable. Even when the phenol-sulphonephthalein test is as low as 20 per cent the condition may return almost to normal after the removal of a renal stone. When only a faint trace of this dye is returned and the blood-urea retention is high, operation is contra-indicated unless the symptoms are very urgent. When renal stones are associated with chronic nephritis their removal will have no effect on the primary nephritis, although when they occur with pyelonephritis, the effect of removal will be favorable as it tends to diminish the infection. The function of the opposite kidney should be determined as nephrectomy may be found necessary at operation. If the opposite kidney is functionless or absent, conservative surgery is essential.

Because of acute symptoms, operation for stone was necessary in five cases of polycystic kidney seen at the Mayo Clinic. As a rule, however, this condition contra-indicates surgery. In cases of polycystic kidney a study of the comparative renal function is absolutely indispensable.

Coincident diseases may contra-indicate or temporarily postpone operation. Among such conditions the most common are lesions of the alimentary tract. Surgical conditions of the gall-bladder, appendix, and duodenum were present in 10 per cent of the cases of renal or ureteral lithiasis operated on at the Mayo Clinic. Glycosuria indicates the same precautions and preliminary treatment as is necessary in this condition before any other surgical procedure. Cardiac disease, unless compensated or moderately compensated, may prevent operation, especially in the aged. Hypertrophy of the prostate with residual urine must be attended to as usual after preliminary treatment or at least drainage of

the bladder before the removal of the stone. In pregnancy stones may be removed during the first six months, but in the latter months operation should be postponed if possible. Unilateral lithiasis should not cause any serious complication in pregnancy; when bilateral lithiasis is present, however, renal insufficiency may be so well established as to necessitate the termination of pregnancy. Operation was not advised in 79 cases of renal lithiasis during the years 1917 and 1918 on account of co-existing diseases. These diseases the author tabulates.

About 50 per cent of stones in the lower ureter which do not pass spontaneously may be removed by non-operative procedures. A stone more than 2 cm. in diameter which has been lodged in the ureter from three to six months usually cannot be dislodged by cystoscopic methods, but in justice to the patient an attempt should be made to remove it by means of ureteral catheters, dilators, etc., before resorting to operation. Definite contra-indications to further attempts are a stone more than 2 cm. in diameter, acute impaction with continuous obstruction, acute renal infection, intolerance on the part of the patient to the cystoscope, and anatomical deformity.

In conclusion the author emphasizes three points with regard to renal and ureteral lithiasis: (1) the majority of renal and ureteral stones pass spontaneously; (2) a large number of stones in the lower ureter, which do not pass after one or two attacks of renal colic, may be dislodged by cystoscopic manipulation; and (3) immediate operation for the removal of small stones producing symptoms of short duration is seldom justifiable.

MERLE R. HOON.

**Rytina, A. G.: The Treatment of Essential Renal Hæmaturia by Intrapelvic Injections of Silver Nitrate.** *J. Urol.*, 1920, iv, 317.

The treatment of painless and more or less constant essential renal hæmaturia is of two kinds, non-operative and surgical.

Renal hæmaturia which has been thoroughly studied and found not to be due to stone, tuberculosis, or neoplasm should first be subjected to the conservative methods of treatment before surgical intervention such as nephropexy, decapsulation, nephrotomy, and nephrectomy, is considered.

In non-operative treatment the injection of from 4 to 8 cm. of a 5 per cent solution of silver nitrate into the kidney pelvis is of great benefit. Three cases are cited in which this method gave good results. One was that of a man 49 years old who had undergone pyelotomy and nephrotomy on the left kidney. Following these operations the bleeding became worse. Twelve weeks later 10 cm. of 5 per cent silver nitrate were injected into the kidney pelvis and within forty-eight hours the bleeding had stopped entirely and the urine was microscopically and chemically negative as regards blood.

HENRY W. PLAGGEMEYER.

**Toupet, R.: The Technique of Nephrostomy** (Technique de néphrostomie). *J. d'urol. méd. et chir.*, ix, 191.

In Toupet's opinion the method of nephrostomy recently described by Marion is rendered difficult by hæmorrhage when the inferior calix is sought from front to rear and there is danger of injury to the renal artery.

On the basis of a large number of experimental investigations on the cadaver carried out since 1912 Toupet has devised a method of performing nephrostomy which obviates the disadvantages in the classical operations. So far, however, he has not tested it out clinically. Instead of the difficult search for the inferior calix through the bleeding renal parenchyma the kidney pelvis is located and incised and a bent forceps is easily pushed into the inferior calix, the kidney is perforated from the calix toward the convex edge, the jaws of the forceps are then opened, and a sound is drawn through into the pelvis. It is impossible to make a false passage and the traumatism is reduced to a minimum. The sound is fixed to the kidney capsule and the kidney itself is fixed in the lumbar wound in order that the trajectory may be as direct as possible and found again easily if the sound is removed. The entire kidney must be brought to the surface and the posterior side of the pelvis exposed.

The technique is described in detail and illustrated. Certain modifications are necessary if it is desired to deviate the course of the urine.

WILLIAM A. BRENNAN.

**Kidd, F.: The Treatment of Calculi Impacted in the Pelvic Portion of the Ureter.** *Brit. M. J.*, 1920, ii, 160.

Stones impacted in the pelvic portion of the ureter are usually solitary and opaque to the X-ray, and seldom bilateral. Fibrosis of the ureteral wall and stenosis at the site of the impaction frequently develop, with consequent dilatation of the portion of the ureter above the obstruction. Infection from above is prone to occur in the dilated portion of the ureter and kidney of the affected side.

The symptoms produced by ureteral stone are similar to those of renal calculi but a stone may remain lodged for many years in the lower ureter without giving rise to symptoms. Hæmaturia is common, but not always present. A diagnosis of ureteral calculi can scarcely be made, however, in the absence of microscopic blood in the urine.

A correct diagnosis is essential to proper treatment. Several causes of renal colic, such as the passage of stone, blood clot, tuberculous curds, masses of new growth, or hydatid cysts, must be borne in mind. Renal colic may be caused also by stenosis or kinking of the ureter. Ureteral pain should be distinguished from pain arising in other intra-abdominal organs and from tabetic crises. X-ray study supplemented by special urological methods is of great value in arriving at a correct diagnosis.



Kidd makes a plea for conservative treatment. He points out that stones lodged in the ureter may be passed naturally if left alone. He states, "Provided, then, that there are no imperative indications for operative interference, I think it advisable always to give the patient at least one to two years in which to pass a ureteric stone naturally, aiding nature by minor cystoscopic manipulative measures and employing flushing treatment and urinary antiseptics by the mouth."

The minor cystoscopic operations for the extraction of ureteral stone should be tried in most cases. These methods are: (1) the injection of sterile paroline through a ureteral catheter, (2) the use of papaverine injected into the ureter to reduce spasm, (3) the cutting and dilating of the ureteral orifice, as described by Bransford Lewis, or by cautery, and subsequent withdrawal of the stone, and (4) the dilating of the ureter below the stone by means of a dilatable rubber bag on a ureteral catheter.

The author prefers the small muscle-splitting incision described by him in the *Lancet*, June 7, 1913, if open operation is to be done, as postoperative herniæ are then avoided. GORDON S. FOULDS.

**Peterson, R.: Uretero-Ureteral Anastomosis.** *Surg., Gynec. & Obst.*, 1920, xxxi, 132.

In the case reported the right ureter was divided during the radical abdominal removal of a cancerous uterus. The anterior surface of the bladder end of the cut ureter was therefore split for  $\frac{1}{4}$  in. and the mucosa trimmed off for a short distance. The kidney end of the ureter was drawn into the distal end by a traction suture passed through the kidney end and then through the distal end  $\frac{1}{2}$  in. below the angle of the anterior slit. At the point of entrance the two ends were sewed together with five fine silk sutures which included all of the coats except the mucosa. The slit portion of the distal end was united with three fine silk sutures. The ureter was then covered with pelvic peritoneum. Drainage was established through the vagina.

Eight months later ureteral catheterization showed a steady flow of urine from the right side suggesting dilatation and paralysis. The diagnosis was a minor degree of dilatation of the terminal calyces, pelvis, and ureter, with diminution of function.

The reports of 72 cases of uretero-ureteral anastomosis have been collected by the author from the literature. Each of these cases is analyzed. The primary mortality was 5.5 per cent. End-in-end or end-in-side uretero-ureteral anastomosis has demonstrated better results than the lateral implantation or oblique end-to-end anastomosis advocated by Bovée.

The important points brought out in the paper are summarized as follows:

Uretero-ureteral anastomosis is not successful unless the kidney and ureter have been carefully followed and explored.

A careful study of the literature shows that end-to-end, end-in-end, and end-to-side anastomoses are feasible.

A functioning kidney and ureter can be obtained with little or no ureteral stricture.

The primary mortality is small.

Leakage leads usually to stricture, hydro-ureter, and hydronephrosis.

Because it prevents leakage the invagination method is preferable to others.

End-to-end anastomosis is simple and uses only a small amount of the ureter.

Slight hydro-ureter and hydronephrosis follow.

CLAUDE D. PICKRELL.

## BLADDER, URETHRA, AND PENIS

**Nassauer, M.: Malignant Bladder Tumors in Employees of the Organic Chemical Industry** (Ueber boesartige Blasengeschwuelste bei Arbeitern der organisch-chemischen Grossindustrie). *Frankfurt. Ztschr. f. Pathol.*, 1920, xxxii, 353.

The author, who was manager of an organic-chemical plant for twenty years, reports 32 cases of tumors of the bladder among the employees of the plant and 6 other cases which were referred to him. After reviewing the literature in which, to date, 61 cases have been described, he discusses the chemical composition and physiological action of the many substances which have been held responsible for such growths. He comes to the conclusion that the causative agent is anilin.

Even men working at a distance from anilin may become affected by it and therefore the poison is probably inspired with the air. The time from the beginning of its absorption to the development of symptoms varies between twelve and twenty years. The purer the anilin vapors the longer the incubation period; at a certain degree of dilution the vapors are taken up by the alveoli and carried to the circulation more easily.

In spite of various precautionary measures which have reduced the number of cases materially, employees in plants using anilin should not be permitted to remain exposed to it longer than three months.

WINIWARTER (Z).

**Stutzin, J. J.: The Treatment of the Most Severe Strictures and Fistulæ of the Male Urethra** (Zur Behandlung der schwersten Strikturen und Fisteln der maennlichen Harnroehre). *Therap. d. Gegenw.*, 1920, lxi, 21.

For the most severe strictures of the male urethra the author recommends the internal or external urethral incision or the radical operation consisting of the excision of all scar tissue and circular union of the urethral stumps. The latter, however, is possible only if the defect is not greater than 3 cm. If after excision of the scar the defect is more than 3 cm. and union can be effected only by tension, a true urethrostomy uniting both ends to the skin is to be preferred. In such cases a retention catheter

is placed in the bladder so that the opening will heal by primary intention. After that the fistula is closed secondarily.

The same method is followed if the removal of all scar tissue is impossible. As a second choice the defect may be closed by plastic methods by which a flap is brought into place or a vein or the appendix is used to repair the defect. The latter method, however, is often unsuccessful.

If the urethral stricture is complicated by a fistula and a large defect is present, plastic closure with a pediculated flap is indicated. The pedicle of the flap should be as broad as possible, the flap itself as short as possible. If a flap is required which is long in relation to the length of its pedicle, the defect should be covered in several stages. If all the scar tissue cannot be removed and if it is impossible to obtain sufficient material for a flap, the scar itself may be utilized for plastic closure of the defect. In most cases, however, a flap may be obtained from the inguinal region, the skin of the thigh, and especially the skin of the scrotum. In many cases a complete result is not obtained at the first attempt and repeated operations are necessary.

ADLER (Z).

#### GENITAL ORGANS

**Macht, D. I., and Matsumoto, S.: Physiological and Pharmacological Studies of the Prostate Gland. II. The Action of Prostatic Extracts on Excised Genito-Urinary Organs.** *J. Urol.*, 1920, iv, 255.

Genito-urinary organs or parts of organs freshly excised from various animals having been suspended in warm and oxygenated physiological solutions, the curve of normal tonus and contractions was studied. Small doses of a prostatic extract were then introduced into the chamber and their effect on tonus and contraction was observed. The investigation showed that all the genito-urinary organs studied are stimulated by prostatic extracts, but the minimal amount required for such stimulation varies with the kind of organ, the animal to which it belongs, and the nature of the extract. The uterus and tubes are most easily and quickly excited to contraction. Next in order come the bladder, the ureters, the vas deferens, and lastly the seminal vesicle. No definite or specific relationship between the tonus and contraction of the bladder and extracts of the prostatic gland was noted.

HENRY W. PLAGEMEYER.

**Lespinasse, V. D.: Local Treatments for Seminal Vesiculitis, with a Description of Some New Methods.** *J. Urol.*, 1920, iv, 265.

The author presents new methods for making injections through the vas deferens in the treatment of seminal vesiculitis. By one of these procedures the vas is exposed and wrapped with a Thiersch skin graft so that it projects free from the scrotum. The second method consists of the "intra-dermal trans-

plantation of the vas." The most simple procedure, which does not require incision or dissection, is a "percutaneous puncture of the vas." To insert a needle into the lumen of the vas without making a cut through the skin Lespinasse holds the vas in a small fold of skin by means of clamps. This manipulation identifies the vas through which the needle can be inserted.

The author has found that 10 per cent collargol is the least irritating antiseptic and enters the vesicle well. A 1 per cent solution of sodium bicarbonate is safe, but a 5 per cent solution is destructive to the epithelium. Acriflavine 1:1000 also destroys the vas epithelium. Bactericidal serum is absolutely specific and may be administered successfully by percutaneous puncture of the vas.

HENRY W. PLAGEMEYER.

#### MISCELLANEOUS

**Labbé, M., and Carrié, P. A.: The Enterohepatic Theory of Urobilinuria** (La théorie enterohepatique de l'urobilinurie). *Presse méd.*, Par., 1920, xxviii, 353.

As a result of their investigations regarding urobilinuria the authors are convinced that the only theory which explains the genesis of urobilin in accordance with the clinical and experimental findings is the enterohepatic theory. Urobilinuria is the index of functional insufficiency of the liver rather than hyperfunction. It may coincide with, but is not the consequence of, hypercholæmia.

While it is possible that urobilin may originate in the blood itself in the course of serious hæmolytic conditions, or from a subcutaneous hæmatoma, or even from changes in the bile pigments impregnating the tissues, such an origin is quite exceptional.

WILLIAM A. BRENNAN.

**Crosbie, A. H.: The Diagnosis and Treatment of Tuberculosis of the Genito-Urinary Tract.** *Boston M. & S. J.*, 1920, clxxxiii, 134.

In this paper the author gives a brief résumé of the views generally held today regarding the symptoms, diagnosis, and treatment of renal tuberculosis.

Crosbie believes that infection of the epididymis is always secondary to infection of the prostate and seminal vesicles. He is opposed to the operation of epididymectomy for tuberculosis of the epididymis for the reason that the primary focus in the seminal vesicle is not attacked in this operation. If any operative procedure is required, he favors the radical operation described by Quinby (*J. Am. M. Ass.*, Nov. 30, 1918), but believes such a radical procedure is rarely indicated. He relies on hygienic measures. In cases of abscess formation, he believes the ulcers should be allowed to rupture spontaneously. They will drain for a time and finally heal.

No mention is made of the use of tuberculin in the treatment of genital tuberculosis.

HARRY A. FOWLER.



**Tardo, G. V.: The Formation of Calculi about Foreign Bodies** (Sulla formazione di calcoli attorno a corpi estranei). *Policlin.*, Roma, 1920, xxvii, sez. chir., 225.

The author reviews the literature concerning the formation of urinary calculi and reports the results of experiments he carried out to determine whether such calculi can form about a foreign body introduced into the urinary tract.

In these experiments a nephrotomy was done on the anterior or posterior surface of the left kidney, a fragment of a sterilized urinary calculus obtained from a case of urinary lithiasis was introduced into the pelvis, and the wound then sutured without drainage.

At autopsy, which was performed from forty to one hundred days later on 10 dogs operated upon in the manner described, it was found that in 2 cases, because of an error in technique, the calculi had been placed in the renal parenchyma outside the pelvis. In 3 cases it was impossible to discover them again, but in 5 cases they were still present. In 2 of these 5 cases in which 2 fragments of calculus had been placed in the pelvis one of them was found in the pelvis and the other in the ureter.

In all instances the wounds had healed by first intention and no infection of any kind had been produced by the inserted calculus.

In no case was any kind of deposit found upon the introduced calculus. The fragments were the same in volume as when they were inserted.

Histologically in all instances more or less necrosis was observed in the zone of the foreign body. In 1 case atrophy of the kidney and closure of the ureter were found. In 3 cases the kidney had increased in volume. Calcification of the renal tubuli was noted in the cortex in 3 cases and in the necrosed zone in all. In 2 cases cysts had been formed in the wall of the pelvis. In 2 cases a large pedunculated papilla was found in the pelvis. In 1 case metaplasia and keratinization of the pelvic epithelium were discovered. In 3 cases the walls of the pelvis contained osteoid tissue.

From this experimental study Tardo draws the following conclusions:

1. The kidney of the dog constantly endeavors to expel fragments of calculus introduced into the

pelvis. The presence in the pelvis of fragments of a urinary calculus obtained from a case of urinary lithiasis was not sufficient under conditions of asepsis to cause the precipitation and deposit of the calcareous substances normally contained in the urine. These experimental data, in accord with data furnished by the clinic, show that a particular morbid disposition on the part of the renal parenchyma and super-saturation of urine are essential for the formation of calculi.

2. The fragments of urinary calculi introduced into the pelves of the kidneys of animals of a species different from that in which they had been formed were slowly reduced in volume when, because of their chemical and structural composition, they were friable. The mechanical and chemical action occurred simultaneously. In all cases the pelvis and ureter hypertrophied and dilated in order to expel the calculus.

3. It was not possible to find precisely what anatomical changes occurred in the kidneys of dogs following the introduction of fragments of urinary calculi or to distinguish the lesions due to the nephrotomy from those due to the calculus.

4. A nephrotomy on the dog done in a direction perpendicular to the deep renal vessels outside the pelvis causes very severe lesions, especially wide necrosis, calcification of the necrosed tracts of the cortex and pelvis, symptoms of acute interstitial nephritis, and the extensive production of connective tissue.

5. The connective tissue which invades necrotic and calcified zones of the pelvis sometimes undergoes metaplasia into osteoid tissue.

6. The irritation produced by a calculus may cause metaplasia and keratinization of the pelvic epithelium. The stimulated and proliferating epithelium gives rise to the formation of large papillæ or even of cysts in the walls of the pelvis.

7. In dogs in which the drainage of the urine was obstructed by blocking of the ureter, atrophy of the kidney with absence of signs of dilatation and stasis was observed. When the occlusion was due to calculus, atrophy and very evident symptoms of dilatation of the canalicular system were found even when the obstruction was incomplete.

WILLIAM A. BRENNAN.

# SURGERY OF THE EYE AND EAR

## EYE

**Benedict, W. L.: The Early Diagnosis of Pituitary Tumor with Ocular Phenomena.** *Am. J. Ophth.*, 1920, iii, 571.

The marked advance in surgical therapy of pituitary disorders made during the past five years is due in large part to the greater certainty with which tumors of the hypophysis have been diagnosed, and to the fact that such a diagnosis can be made early in the course of the disease.

Ocular changes constitute the chief symptoms in a large number of cases of pituitary tumor and are often the only means of identifying the condition. These consist in contracted fields, lowered visual acuity, and changes in the ophthalmoscopic picture of the nerve heads. The frequent absence of constitutional disorders and the negative findings on examination of the central nervous system except as regards ocular disorders place such cases in the hands of the ophthalmologist.

The characteristic ophthalmoscopic picture in the early stages of the disease consists of a waxy pallor of the nerve head without shrinkage or other change in form, and serves as a basis for estimating the probability of recovery of vision.

Atrophy of the optic nerves following shortly after the onset of visual changes indicates pressure rapidly produced or pressure associated with processes leading to early destruction of the optic tract. Since rapidly developed pressure is more apt to result from malignant tumor or cysts than from benign tumors the prognosis in cases of beginning atrophy early after the onset of visual changes must be guarded. As optic atrophy of both eyes ensuing after long duration of visual symptoms will not be improved materially by the removal of the pressure, the prime object to be attained by the operation is beyond reach, and operation for visual purposes should not be undertaken. The chief object of the ophthalmoscopic examination then is to ascertain whether or not the optic nerve has atrophied.

The visual acuity and visual fields may not be of aid in the prognosis in cases of low vision, and it is only from the amount of atrophic shrinkage that it can be determined whether the nerve will be in a condition to resume function when the cause of the pressure has been removed.

**Hay, P. J.: Some Plastic Operations about the Lids and Socket.** *Brit. J. Ophth.*, 1920, iv, 368.

The use of grafts with pedicles rather than isolated grafts is advocated because the former are easier to work with, they "take" more frequently, and the flap may be kept very thin and undergoes little shrinkage.

In operations for ectropion of the lower lid Hay transplants into the lower lid, close to the free border, a flap taken from close under the eyebrow with a pedicle slightly above the sac region (or above and external to the external canthus). If the entire lower lid is affected, a strip with a pedicle at both ends is used. To obviate bulging, the flaps are made thin.

To form a lower cul-de-sac, Hay takes a narrow flap with a broad pedicle from low down on the lid and, buttonholing the lid, sews the upper edge of the flap to the posterior wound of the conjunctiva. A week later he cuts the skin portion of the pedicle and sutures it to the palpebral conjunctiva, at the same time closing the lid wound from which the pedicle was taken. This graft is anchored firmly to the periosteum.

The same operation may be done with the upper lid to make a fornix or fix the soft tissues of the roof of the orbit when they interfere with the wearing of an artificial eye.

THOMAS D. ALLEN.

**Matsuoka, Y.: The Nature of the So-Called Blood Infiltration of the Cornea.** *Am. J. Ophth.*, 1920, iii, 564.

The so-called "blood infiltration of the cornea" occurring in traumatic hæmorrhage into the antechamber is characterized histologically by the presence of numerous peculiar round or spindle-shaped highly refractive granules in the parenchyma of the cornea. These granules have been variously described as types of organisms, crystallized fibrin, hyalin, degenerated corneal fibrils, hæmoglobin derived from hyalin substance, an albuminous mass separated from hæmoglobin, etc.

The author reports the clinical and histologic findings in two cases which he believes furnish some evidence as to the nature and origin of these granules. In the first case, a case of old traumatic hæmorrhage of the vitreous, histologic examination of the vitreous revealed numerous small granules, some of which were free and others contained in blood-cell shadows. This finding, in the author's opinion, proves that the granules arise from the blood-cell shadows. In the other case, a case of traumatic hæmorrhage of the vitreous and anterior chamber with typical blood infiltration of the cornea, similar granules were found both in the vitreous and in the parenchyma of the cornea. These granules were of the same type as those which have been described as characteristic of the so-called "corneal blood infiltration." Therefore as those found in the vitreous and those found in the cornea showed the same behavior toward different stains and chemical reagents, it is probable that they are identical.

From these facts it seems evident that the corneal granules are not formed *in loco*, but are carried to the



cornea from some other point. The author's evidence supports this view rather than the assumption that the granules in the corneal parenchyma are developed by the conversion of the free blood coloring matter in the anterior chamber to a combined state, or that they are formed in the cornea itself. The route by which the granules enter the cornea is still unknown.

The author further concludes that the presence of the characteristic granules is not necessary to complete the picture of blood infiltration and cites a type of case in which the staining of the cornea is caused exclusively by free blood coloring matter, a fact which suggests that possibly the typical staining of the cornea and the presence of granules may not be related at all. WILLIAM F. MONCREIFF.

**Morax, V.: Cataract Operations on Glaucomatous Patients.** *Am. J. Ophthalm.*, 1920, iii, 561.

Morax limits his discussion to cases in which senile cataract develops in eyes previously affected by glaucoma and in which an iridectomy or sclerectomectomy has rendered the equilibrium of the ophthalmotonus satisfactory.

The indications for the removal of cataract are the same in these cases as in others; i.e., the more mature cataract should be extracted as soon as useful vision is lost.

Two cases are described. In the first, hypertension of the left eye of four years' duration was controlled by iridectomy. Within the next year, however, the lens of this eye began to become opaque, and a cataract extraction was done six years after the iridectomy. A good result was obtained as the scleral section left a small filtering scar and the tension has remained within normal limits. The visual acuity with correction of aphacia is one-third.

In the second case sclerecto-iridectomy on the left eye was done three times before a satisfactory filtering scar was obtained. Peripheral opacities in the lens had been present for at least six years before the first operation, and about a year and a half after the successful trephination the lens had become so opaque that extraction was necessary. In this operation the incision was placed outside the filtering scar so as not to destroy it. The filtering scar ceased to function, however, and the tension rose in spite of miotic treatment. Another sclerecto-iridectomy was then done, but a filtering scar was not obtained and within a year vision was lost. WILLIAM F. MONCREIFF.

**Goulden, C.: The Treatment of Prolapse of the Iris Following Accidental Perforating Wounds, with a Note on the Removal of Non-Magnetic Foreign Bodies from the Anterior Chamber.** *Proc. Roy. Soc. Med.*, Lond., 1920, xiii, Sect. Ophth., 67.

The author first points out the dangers of allowing a prolapsed iris to heal spontaneously. The treatment must be based on the position of the corneal wound.

If the wound is situated entirely in the cornea or at the limbus, Goulden makes a preliminary incision with a keratome at the limbus on the opposite side of the cornea. Then, by very gentle traction throughout the entire length of the prolapse, he frees the iris so that when it is cut off the rest of it will spring back into the anterior chamber. If the wound is more than twenty-four hours old a stream of warm saline solution is necessary during this procedure to clear away the exudate. The prolapsed iris is cut off close to the cornea with a DeWecker scissors. The repositor is then introduced through the incision made with the keratome and the pillars of the coloboma are replaced.

When the sclera also is involved the wound of the conjunctiva is exposed freely and the conjunctiva undermined on each side. The edges of the wound are then held open by an assistant while the operator deals with the prolapsed uveal tissues. The conjunctiva is brought together in layers, one edge being folded under the other. This procedure approximates the edges of the sclera with the least possible trauma.

When the wound extends across the cornea and through the limbus on each side, the eye should be enucleated at once. If an attempt is made to save the eye, the wound must be thoroughly covered with conjunctiva. "The conjunctiva should be detached from the periphery of the cornea in about its lower third or over one-half, and drawn straight across the cornea and sutured to the opposite limbus. Such sutures will hold for from five to seven days, and when they break loose the conjunctiva will have become thoroughly adherent to the site of the injury."

To remove a non-magnetic foreign body from the anterior chamber Goulden makes a keratome incision in the cornea 3 mm. inside the limbus as near the foreign body as possible, driving the point of the keratome directly toward it. He then seizes the foreign body with toothless iris forceps and withdraws it. He claims this method is much easier than making the incision at the limbus.

THOMAS D. ALLEN.

## EAR

**Vail, H. H.: Studies of the Barany Rotation and Caloric Tests of Tumors of the Nervus Acusticus.** *Laryngoscope*, 1920, xxx, 505.

The author records the findings obtained in ten cases of verified unilateral tumor of the eighth nerve by the Barany rotation and caloric tests. In the majority of the cases the reactions were typical.

Unilateral deafness on the side of the lesion varied from absolute to marked involvement.

In the caloric test there was failure to obtain after-nystagmus and past-pointing by stimulation of the labyrinth on the side of the lesion and in some cases to obtain after-nystagmus and past-pointing by stimulation of vertical canals on the side opposite the lesion.

As a general rule the time of the after-nystagmus obtained by rotation was decreased but did not show that there was blocking of one labyrinth.

The past-pointing tests following rotation usually did not show any reactions that might be classed as typical. The reactions were abnormal and probably influenced by involvement of the cerebellum through direct or indirect pressure.

In two cases with failure to produce nystagmus in a caloric test of the unaffected side after operation the reactions of nystagmus and past-pointing were absent in the side of the lesion and practically normal following stimulation of the opposite side. The increased pressure present in all these cases was doubtless responsible to a great extent for the irregular reactions obtained in the rotation tests.

In some of the cases postoperative tests of the side involved showed an increase in the cochlear function.

Unilateral paralysis of the external rectus may cause unequal involvement of the eyes in the spontaneous nystagmus. In after-nystagmus by stimulation this is a negative factor.

JAMES J. KING.

**Carpenter, E. R.: Intracranial Lesions Involving the Auditory-Vestibular Apparatus.** *J. Am. M. Ass.*, 1920, lxxv, 469.

The three types of intracranial lesions in which auditory and vestibular tests may be of service are advantageously classified as follows: (1) lesions primarily involving the cerebellar fossa; (2) lesions primarily involving the brain stem and midbrain; and (3) lesions primarily involving the cerebral cortex and subcortical region.

In all cases in which major otological operations are necessary repeated vestibular tests should be made as they often indicate impending intracranial trouble long before the clinical symptoms of the develop.

Lesions in the region of the cerebellum are represented by acute inflammatory diseases involving the meninges, acute and chronic abscesses, tumors of the meninges and nerve trunks, syphilis in its various forms, traumatism, circulatory diseases, tuberculosis, and multiple sclerosis.

It is a noteworthy fact that 8 per cent of abscesses in the posterior fossa are due to infection of the ears. According to Cushing, 6 per cent of all brain tumors and over 20 per cent of all tumors of the posterior fossa originate in the eighth nerve. A correct diagnosis must be based on the demonstration of the auditory nerve syndrome consisting of primary deafness followed by fifth or seventh nerve trouble on the same side and later by other angular symptoms.

Some impairment in the auditory-vestibular apparatus is present in at least 50 per cent of all cases of brain syphilis and occasionally this apparatus is involved also in lesions due to traumatism, tuberculosis, circulatory disturbances, and multiple sclerosis. Aside from intracervical lesions which involve the auditory vestibular apparatus directly, tumors in the supratentorial region, or frontal lobe tumors, may cause symptoms from transmitted pressure closely resembling those observed in direct lesions. In such cases the vestibular tests are frequently valuable in the differential diagnosis between cerebellar and cerebral lesions.

JAMES J. KING.



# SURGERY OF THE NOSE, THROAT, AND MOUTH

## NOSE

**Armstrong, M.:** The Clinical Significance of the Bacteriological Examination of the Accessory Nasal Sinuses and the Ears. *J. Iowa State M. Soc.*, 1920, x, 209.

Of 45 cases in which there were no symptoms or local lesions other than those of chronic tonsillitis and adenoids, the X-ray findings were negative and the washings contained neither pus nor mucus, 70 per cent were sterile and in the other 30 per cent only such bacteria as were present in the nasal secretions were discovered. In no case were hæmolytic streptococci found. Of 15 other cases exactly similar except for the fact that the antra appeared blurred in the X-ray picture, 80 per cent were sterile, and in the other 20 per cent no virulent organisms were present. In 3 cases the only indication of sinus trouble was pus and mucus in the antrum. In 1 of these cases the cultures were sterile and in the others contained only such organisms as are normally found in the nose. In the author's opinion it is probable that the secretions had been in the antrum since a recent coryza and were doing little or no harm. In 12 cases of chronic arthritis the sinuses were found to be sterile in 2 (16 per cent). The hæmolytic streptococcus was the only organism in 1 case and in 8 others was discovered with other organisms, making 9 cases (75 per cent of the total number) in which it was found.

It is the consensus of opinion that the presence of the encapsulated streptococcus in pathologic conditions of the ear renders immediate operation necessary unless the clinical findings are such as directly contra-indicate it.

OTTO M. ROTT.

## THROAT

**Salzman, S. R.:** Tonsil Infections. *Med. Rec.*, 1920, xcvi, 85.

Too much importance cannot be attached to the tonsils as foci of infection. In the author's opinion the tonsils are the source not only of systemic poisoning, but also of other foci of infection such as cholecystitis and appendicitis. The article contains case reports to illustrate the various conditions due to tonsillar infection:

Some of the conditions mentioned are: (1) numerous attacks of fever (febricula?) with no other symptoms; (2) mild infection with a moderate degree of anæmia; (3) constant fatigue and lassitude; (4) simple albuminuria; (5) conditions in which the urine shows a slight amount of blood, and sometimes albumin; (6) conditions in which the urine contains an unusually large amount of blood; (7) thyroid enlargement; (8) myocardial weakness and angina; and (9) many skin conditions.

OTTO M. ROTT.

**Canfield, R. B.:** The Rôle of the Tonsils in Pulmonary Tuberculosis. *J. Michigan State M. Soc.*, 1920, xix, 415.

The combined statistics of many pathologists show the incidence of tonsillar tuberculosis to be about 4 per cent, and in one series of 200 cases examined clinical manifestations of the disease were present only in 4. While the latent type may be the result of either primary or secondary infection, the manifest form is usually an evidence of secondary invasion, the 4 cases mentioned all showing extensive pulmonary involvement.

The frequent occurrence of bone, joint, and skin tuberculosis can be accounted for only by the assumption that it is due to hæmatogenous metastasis. The author reports a case of diffuse tuberculides which covered the entire surface of the body and cleared up within four weeks after the removal of hypertrophied tuberculous tonsils.

The generally accepted theory that tuberculosis may be spread by lymphogenous dissemination from the tonsils to the hilus and then to the parenchyma of the lung does not satisfactorily explain the frequency of apical lesions. Stereoscopic X-ray examinations have shown a distinct thickening of the extreme apex of the lung, termed "apical pleural cap," and the presence of this condition in the absence of frank pulmonary tuberculosis, but in association with tonsillar and glandular tuberculosis suggests a direct lymphatic drainage from above to the pleura. This assumption is substantiated also by the experiments of Grober who injected Chinese ink into the tonsils of dogs and six months later was able to trace the dye in the deep cervical lymphatics and from there directly into the apical pleura and the parenchyma of the lung.

SPENCER S. HOWE.

**McKinney, R.:** Tonsillectomy in the Adult under Local Anæsthesia by the Sluder Method. *Laryngoscope*, 1920, xxx, 429.

McKinney claims that he obtains successful results with the Sluder technique under local anæsthesia in 99 per cent of tonsillectomies performed on adults. His one failure occurred in the case of a short-necked man 54 years of age. This patient had had a number of attacks of peritonsillar abscess and tonsillitis. His tonsils were of the elongated flat type and so firmly embedded in connective tissue that it was impossible to strip one of them through the ring of the guillotine.

McKinney uses a Sauer modification of the Sluder instrument. Copious bleeding has never occurred in any of his cases at the time of operation, but in several a secondary hæmorrhage came on from two to seven days later. Such hæmorrhages he ascribes to localized sepsis having its origin beneath a blood

clot or to superficial sloughing. He has never observed arterial bleeding in these cases. "Watchful waiting," he believes is the best policy to pursue as the bleeding may stop spontaneously. He inquires whether anyone has known or even heard of a case of fatal secondary hæmorrhage following tonsillectomy.

Otto M. Rott.

**Ramdohr, P.: The Treatment of Laryngeal Tuberculosis with the X-Ray** (Ueber die Behandlung der Kehlkopf-Tuberkulose insbesondere mit Roentgenstrahlen). *Ztschr. f. Ohrenheilk.*, 1920, lxxix, 89.

Of the 103 cases of laryngeal tuberculosis treated at the Heidelberg Clinic during 1917-1918, 43 were treated surgically. In 19 this treatment was combined with X-ray therapy. Sixteen cases were treated with the X-ray alone. In far-advanced cases in which there was great difficulty in swallowing, tube feeding was necessary.

In the 35 cases treated with the X-ray there was marked improvement in 12, among these being 4 cases in which no other local treatment of any kind was given. Thirteen cases were not examined subsequently. Ten cases of severe and extensive laryngeal tuberculosis with miliary tubercles in the mucosa were unimproved except that there was a decrease in the pain after treatment. A few cases are reported in greater detail. Among these was one in which the condition had resisted surgical treatment but showed considerable improvement under X-ray treatment. In another case a large infiltration of the posterior wall which had ulcerated after the use of the galvanocautery disappeared completely after twelve X-ray treatments. In several cases it was possible to cause the disappearance of large closed infiltrations, particularly those of the posterior wall, with X-ray treatment alone.

The X-ray treatment consisted of a single dose of the maximum harmless intensity given every third day on alternate sides of the neck. Single dose, 100 X at a focal distance of 25 cm. Filter, 0.5 cm. zinc foil. Hardness of tube, 10 Bauer. Load, 2½ milliamperes.

O. KAHLER (Z).

**Friedberg, S. A.: Direct Laryngoscopy.** *Ann. Otol., Rhinol., & Laryngol.*, 1920, xxix, 410.

Direct laryngoscopy is less difficult in the case of a frightened child than an attempt to use a mirror, and when with this method a general anæsthetic is used the epiglottis is held away from the laryngeal aperture so that a more extensive view is obtained.

Any laryngeal or tracheal condition of obscure or uncertain origin or development warrants a direct examination. Besides aiding in the diagnosis, the direct method facilitates operative procedures such as those for the removal of foreign bodies, papillomata, or intubation tubes which have been forced into the trachea in attempts at extraction.

Special care is necessary in cases of high-grade dyspnoea, uncompensated heart lesions, myocarditis, and extreme weakness. When the dyspnoea is very severe it is safer to do a tracheotomy before making the direct examination.

The picture obtained does not conform to that described in the text-books as all such descriptions are based on the image as it appears in the mirror.

The epiglottis in children is small, soft, difficult to hold, and easily displaced. Children should be examined in the recumbent position. Equal proficiency in introducing the speculum with either hand is of importance.

In examining for a foreign body in the larynx of an adult the patient should be placed in the recumbent position as there is then less danger of displacing the foreign body downward.

To avoid injury to the interior of the larynx and consequent œdema the writer inserts the tip of the speculum between the base of the tongue and epiglottis. The upper lip is held out of the way and pressure on the teeth is avoided. The only lifting force of value is that directed against the displaceable soft parts.

Suspension laryngoscopy supplements the direct method. The latter is the most suitable as an ordinary procedure but for a prolonged operation the suspension method is to be preferred.

SPENCER S. HOWE.



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The formation of the new company will result in full manufacturing, engineering and research co-operation between Victor X-Ray Corporation and General Electric Company with respect to X-Ray problems. It will extend further the usefulness of the two companies and consequently, present needs for Coolidge tubes and other X-Ray devices will be adequately met.

The executive, administrative, engineering and sales staff of the old Victor Electric Corporation will remain practically unchanged. Mr. C. F. Samms becomes President and General Manager. Mr. J. B. Wantz retains full charge of manufacturing and designing. It is contemplated to bring about a complete co-ordination of the entire Victor Corporation organization with the research and engineering organization of General Electric Company with as little disturbance of the old relationships as possible.

Dr. W. D. Coolidge of the research laboratory of General Electric Company becomes Consulting Engineer of the Victor X-Ray Corporation. Mr. C. C. Darnell of the research laboratory of General Electric Company becomes the Commercial Engineer of the Victor X-Ray Corporation. Mr. W. S. Kendrick, who for many years had charge of the commercial sale of the Coolidge tube, will be General Sales Manager. Mr. L. B. Miller remains General Manager of Agency Sales.

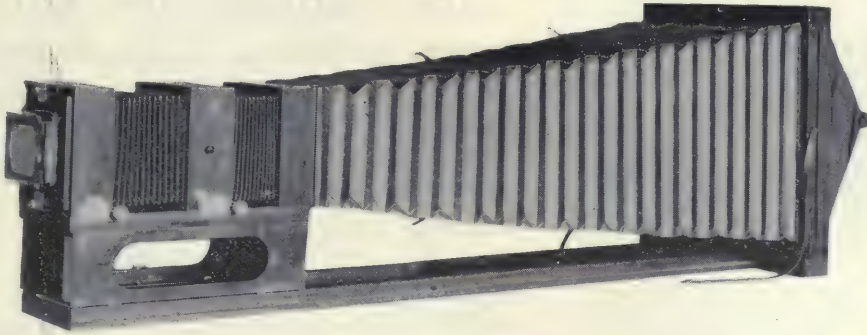
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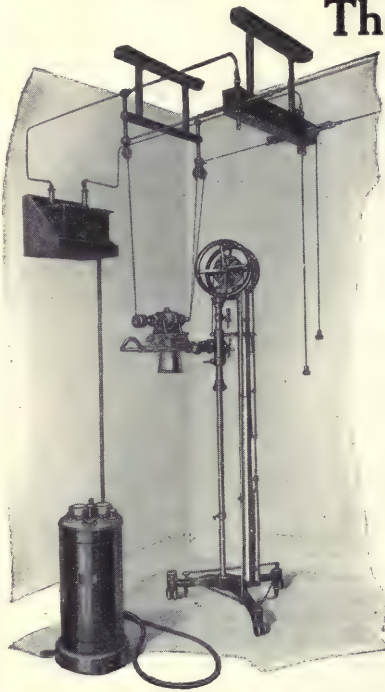
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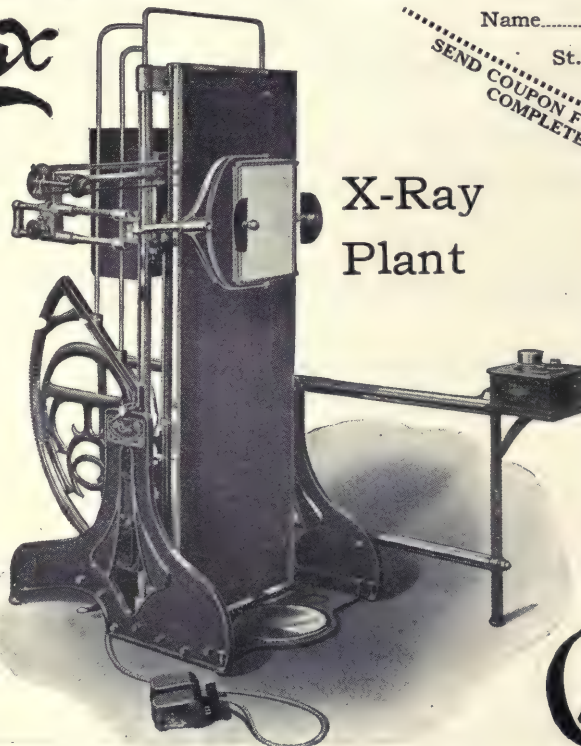
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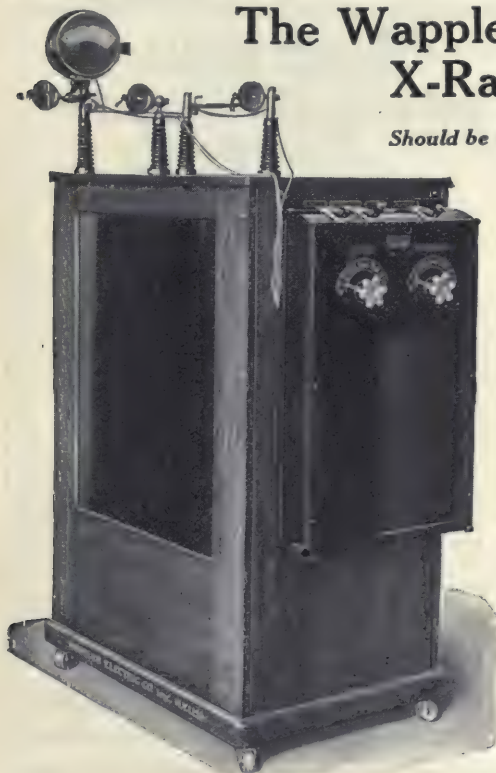
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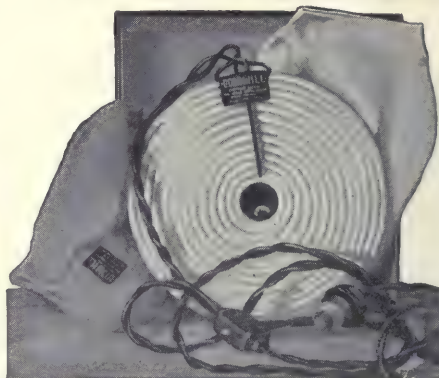
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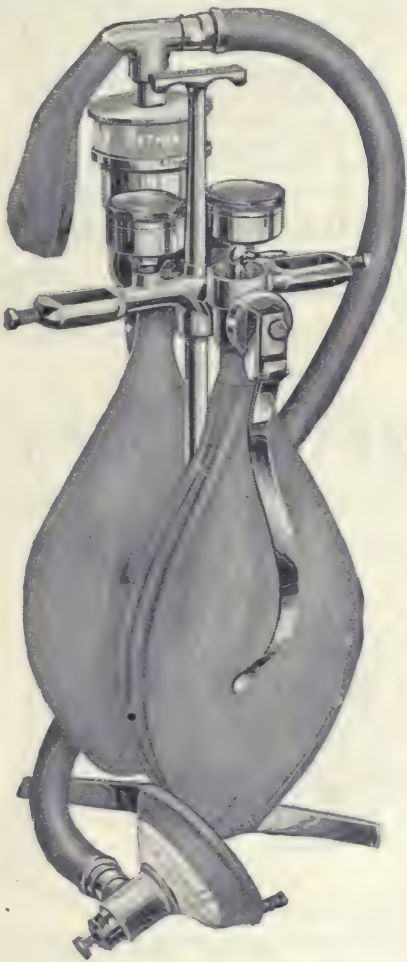
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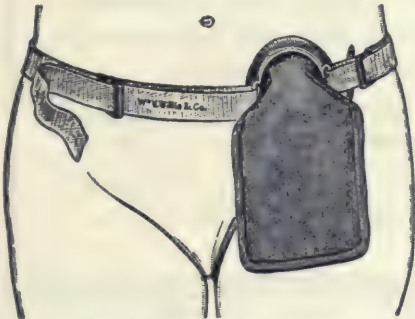
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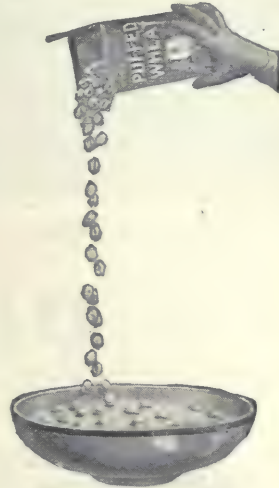
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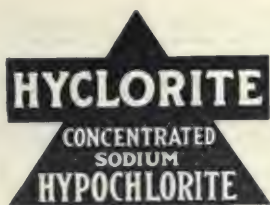
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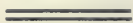
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